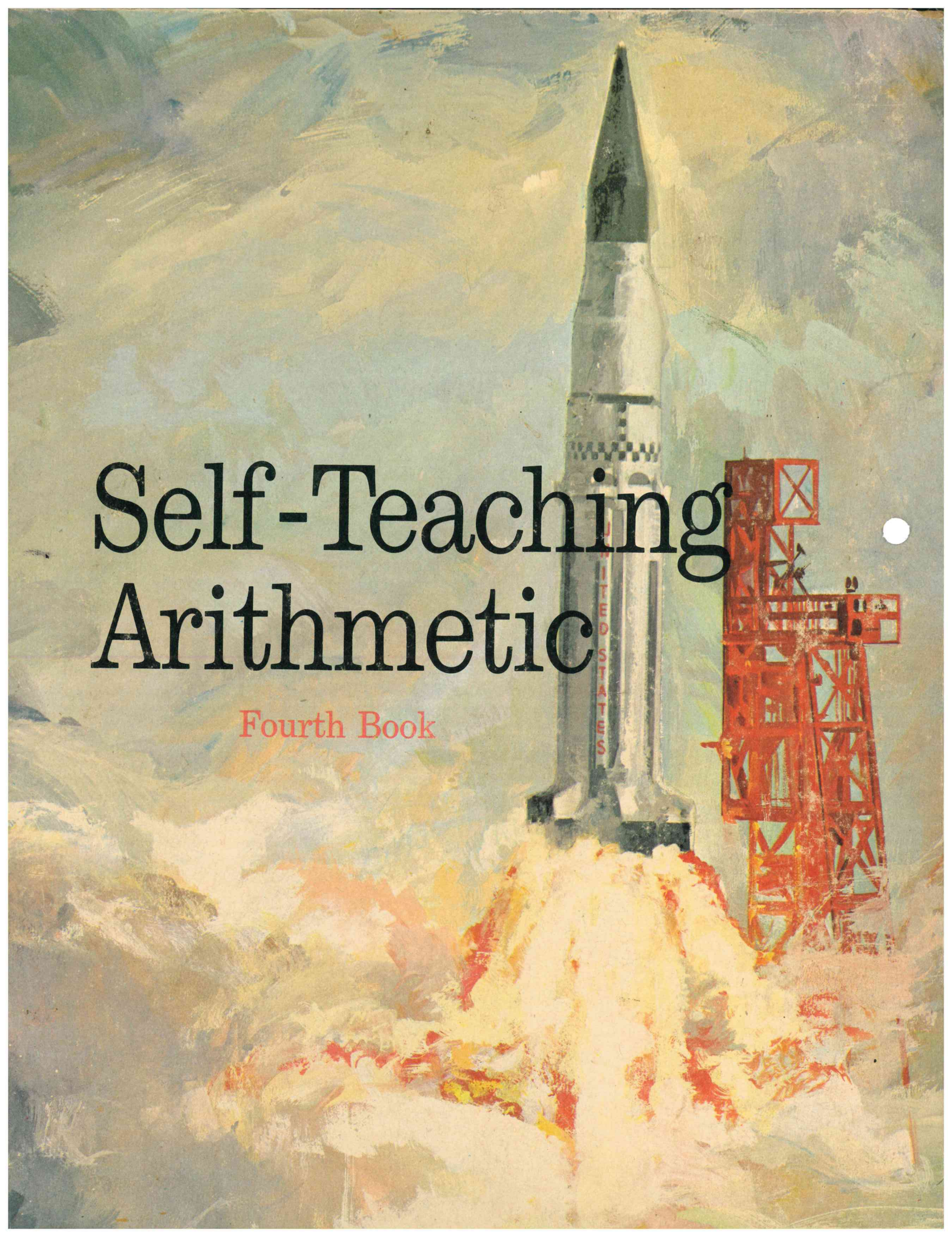

Self-Teaching Arithmetic

Fourth Book

Fourth Book

Self-Teaching Arithmetic

Self-Study

Self-Test

Self-Check

By John W. Studebaker
Vice President, Scholastic Magazines
U.S. Commissioner of Education (1934-1948)
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Illustrated by ORIN KINCADE

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Patent Nos. 2,789,370; 2,834,124

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How to Use This Book

This is a new kind of book designed to enable a child to learn at his own rate of speed. With it he can study the basic arithmetical processes, test his knowledge of them, and correct his test all by himself. The child will, of course, need guidance in the beginning, until he has learned the mechanics of the book. Once he understands how to work with the book, however, he will find it easy to use – and fun to use too.

The book includes 38 pairs of pages. One page in each pair – the Practice Page – contains 32 to 60 examples with apertures ("windows") adjacent to them. The answers for the examples show through the windows. On the Study Pages facing the Practice Pages are illustrations to help the child visualize the appropriate arithmetical processes. (You will find it helpful to turn to the pages cited as you read these directions.)

This is how the child uses the Knowledge Master Book:

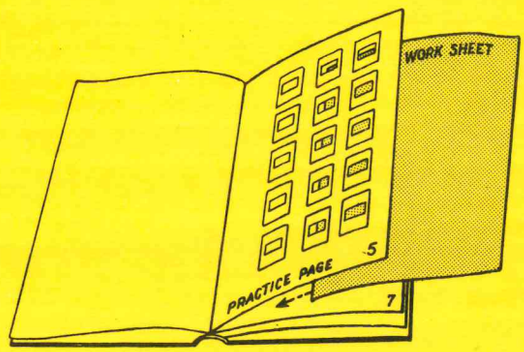
1) The Study Page in each lesson teaches him to understand the new processes introduced on the opposite Practice Page.

2) **He studies** the examples and their answers until he thinks he knows the answers to all of the examples on the Practice Page.

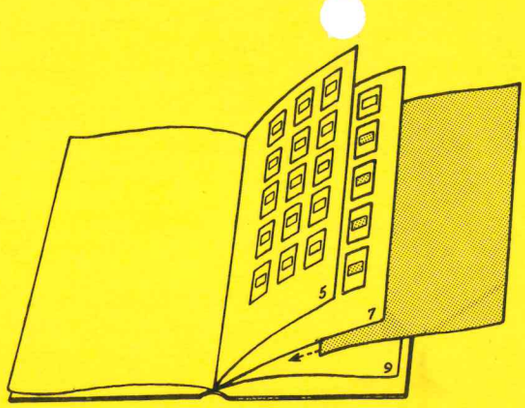
3) **He tests** himself. He puts his work sheet (a piece of paper or a Magic Slate) directly under the Practice Page. If he has been studying the examples on page 5, for instance, he puts his work sheet under page 5 – that is, between pages 6 and 7 and on top of page 7. The answers will then be hidden. If the paper he uses is not opaque enough to hide the answers, he should use more than one sheet. He writes the answers through the windows where indicated.

4) **He checks** his work. When he has written the answers to the examples on page 5, he puts the work sheet under page 7, on top of page 9. Both his answers and the correct answers will show through the windows adjacent to the examples. He checks to see where he is making mistakes. He repeats this process until he answers correctly all of the examples on the Practice Page. Then he goes on to the next lesson.

On each of the Practice Pages you will find directions telling where the child should put his work sheet each time. A good rule for the child to remember is that when he is **testing** himself, he will always put his work sheet under the Practice Page.



When he is **checking** his answers, he will always put his work sheet under the leaf below the Practice Page.



Let's Travel
THE TWOS IN MULTIPLICATION

This page is for study only. Study the panels below as you look at the examples on page 5.

A

Three sets of 2 each

= one 2
= one 2
= one 2

How to Multiply

Three 2's are 6.
$3 \times 2 = 6$

Two 3's are 6.
$2 \times 3 = 6$

Two sets of 3 each

one 3 one 3

× is the **multiplication sign**; it means **times**.

B

One 2 is ▦
$1 \times 2 = ▦$

Two 1's are ▦
$2 \times 1 = ▦$
▦ means "How many?"

C

Two 2's are ▦
$2 \times 2 = ▦$

$\begin{array}{r} 2 \\ \times 2 \\ \hline ▦ \end{array}$

Two times 2 = ▦

D

Two 3's are ▦
$2 \times 3 = ▦$

Three 2's are ▦
$3 \times 2 = ▦$

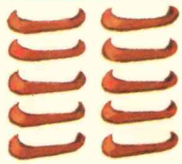
$\begin{array}{r} 3 \\ \times 2 \\ \hline ▦ \end{array}$ $\begin{array}{r} 2 \\ \times 3 \\ \hline ▦ \end{array}$

E

Four 2's are ▦
$4 \times 2 = ▦$

Two 4's are ▦
$2 \times 4 = ▦$

F



Five 2's are ▦
$5 \times 2 = ▦$

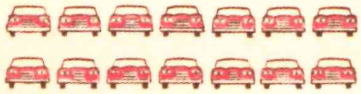
Two 5's are ▦
$2 \times 5 = ▦$

G

$\begin{array}{r} 2 \\ \times 6 \\ \hline ▦ \end{array}$ $\begin{array}{r} 6 \\ \times 2 \\ \hline ▦ \end{array}$

Six 2's are ▦
Two 6's are ▦

H



Two 7's are ▦
$2 \times 7 = ▦$

$\begin{array}{r} 2 \\ \times 7 \\ \hline ▦ \end{array}$ $\begin{array}{r} 7 \\ \times 2 \\ \hline ▦ \end{array}$

Seven 2's are ▦
$7 \times 2 = ▦$

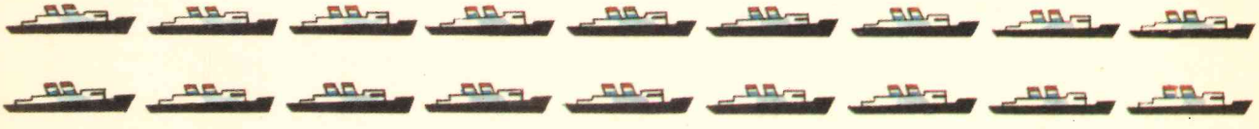
I

Two 8's are ▦
$2 \times 8 = ▦$

$\begin{array}{r} 2 \\ \times 8 \\ \hline ▦ \end{array}$ $\begin{array}{r} 8 \\ \times 2 \\ \hline ▦ \end{array}$

Eight 2's are ▦
$8 \times 2 = ▦$

J



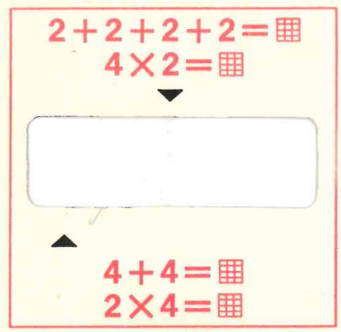
Nine 2's are ▦ Two 9's are ▦ $9 \times 2 = ▦$ $2 \times 9 = ▦$

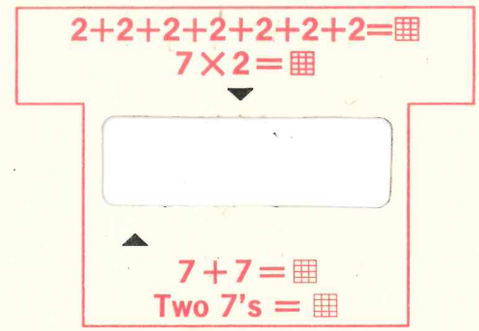
DIRECTIONS: 1 — Study the examples on this page. The red numerals in the windows are the right answers.

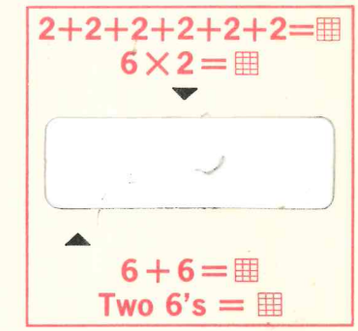
2 — Put a piece of paper or a Magic Slate under this page. Write your answers through the windows where the arrows point.

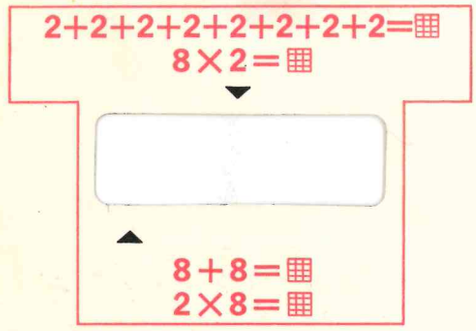
(Both examples in each pair have the same answer, so you need only write it once.)

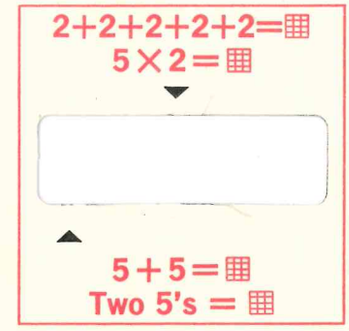
3 — To check your work, put your paper or Magic Slate under page 7. See if your answers are the same as the red numerals in the windows.

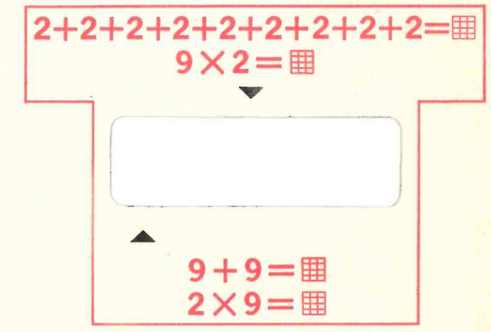


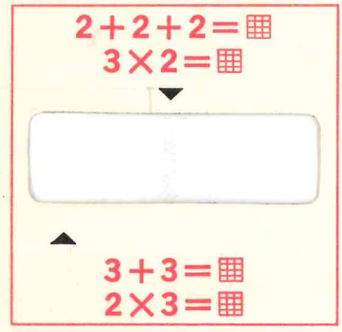


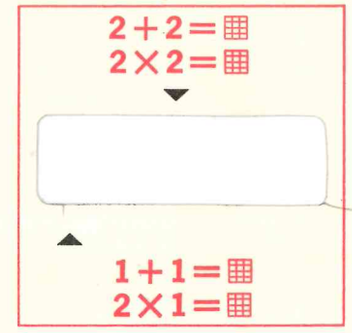


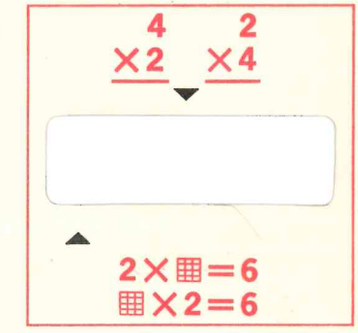


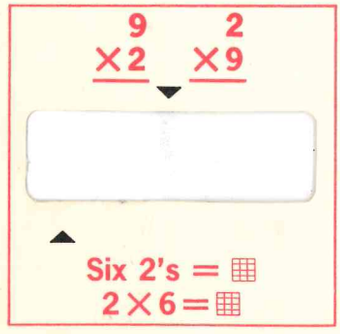


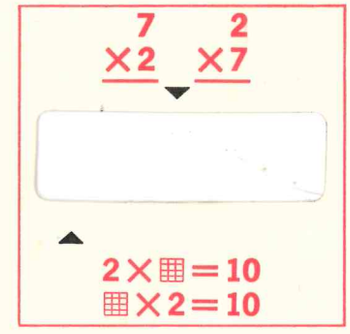


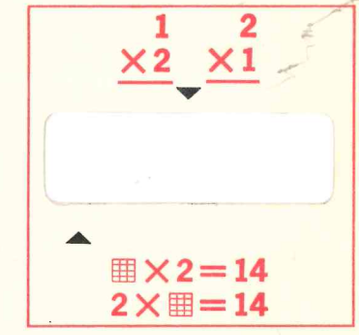


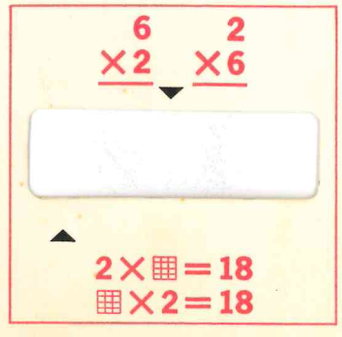


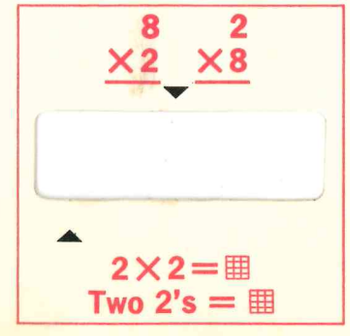


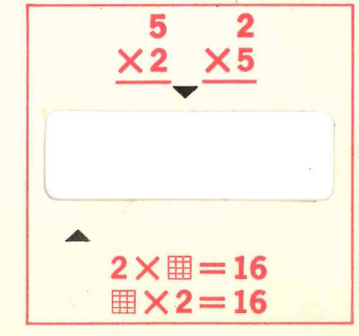












Snow Time
THE TWOS IN DIVISION

This page is for study only. Study the panels below as you look at the examples on page 7.

A

After skating, Nancy divided 6 candy bars this way:

Mother	CANDY	CANDY
Father	CANDY	CANDY
Nancy	CANDY	CANDY

How to Divide

Nancy divided 6 candy bars among 3 people. She gave 2 to each person. $6 \div 3 = 2$

$\div$ is the **division sign**; it means **divided by**.

$6 \div 3 = 2$ can be shown this way: $3\overline{)6}$ $\;2$

12 12 | 21 21 | 18 18

B

How many 2's in 2? $2 \div 2 = \square$

How many 1's in 2? $2 \div 1 = \square$

C

$4 \div 2 = \square$

$2\overline{)4}$ $\;\square$

How many 2's in 4?

D

How many 3's in 6? $6 \div 3 = \square$

How many 2's in 6? $6 \div 2 = \square$

24 24 | 15 15 | 27 27

E

In 8 there are $\square$ 2's. How many 4's in 8?

$2\overline{)8}$ $\;\square$

$4\overline{)8}$ $\;\square$

F

How many 2's in 10? In 10 there are $\square$ 5's.

$2\overline{)10}$ $\;\square$ $\quad$ $5\overline{)10}$ $\;\square$

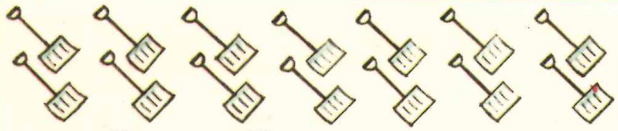
G

How many 2's in 12? $12 \div 2 = \square$

How many 6's in 12? $12 \div 6 = \square$

3 21 | 9 4 | 27 7

H



$2\overline{)14}$ $\;\square$ $\quad$ $7\overline{)14}$ $\;\square$

How many 2's in 14? In 14 there are $\square$ 7's.

I

$16 \div 2 = \square$

In 16 there are $\square$ 2's. In 16 there are $\square$ 8's.

$16 \div 8 = \square$

15 2 | 21 27 | 12 3

J

How many 2's in 18? In 18 there are $\square$ 9's.

$18 \div 2 = \square$

$18 \div 9 = \square$

$2\overline{)18}$ $\;\square$ $\quad$ $9\overline{)18}$ $\;\square$

24 3 | 3 15 | 18 3

DIRECTIONS: **1** — Study the examples on this page. The blue numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers where the arrows point. For the examples below the windows, write your answers through the windows straight over the examples **or** where the arrows point.

3 — To check your work, put your paper or Magic Slate under page 9. See if your answers are the same as the blue numerals in the windows.

□ ÷ 2 = 5 □ ÷ 5 = 2 8 8 □ ÷ 2 = 9 □ ÷ 9 = 2	□ ÷ 8 = 2 □ ÷ 2 = 8 14 14 □ ÷ 2 = 4 □ ÷ 4 = 2	□ ÷ 3 = 2 □ ÷ 2 = 3 12 12 □ ÷ 2 = 7 □ ÷ 7 = 2
□ ÷ 2 = 6 □ ÷ 6 = 2 16 16 □ ÷ 2 = 1 □ ÷ 1 = 2	Two 2's in □ □ ÷ 2 = 2 10 10 2)6	16 ÷ □ = 2 16 ÷ 2 = □ 18 18 2)14
8 ÷ 2 = □ 8 ÷ □ = 2 6 6 5)10	12 ÷ □ = 6 12 ÷ 6 = □ 4 2 2)10	6 ÷ □ = 2 6 ÷ 2 = □ 8 3 9)18
14 ÷ 2 = □ 14 ÷ □ = 2 18 12 2)4	18 ÷ 2 = □ 18 ÷ □ = 2 14 5 6)12	8 ÷ □ = 4 8 ÷ 4 = □ 2 7 2)2
16 ÷ □ = 8 16 ÷ 8 = □ 12 9 2)12	2 ÷ □ = 1 2 ÷ 1 = □ 16 4 2)18	10 ÷ □ = 2 10 ÷ 2 = □ 10 8 7)14

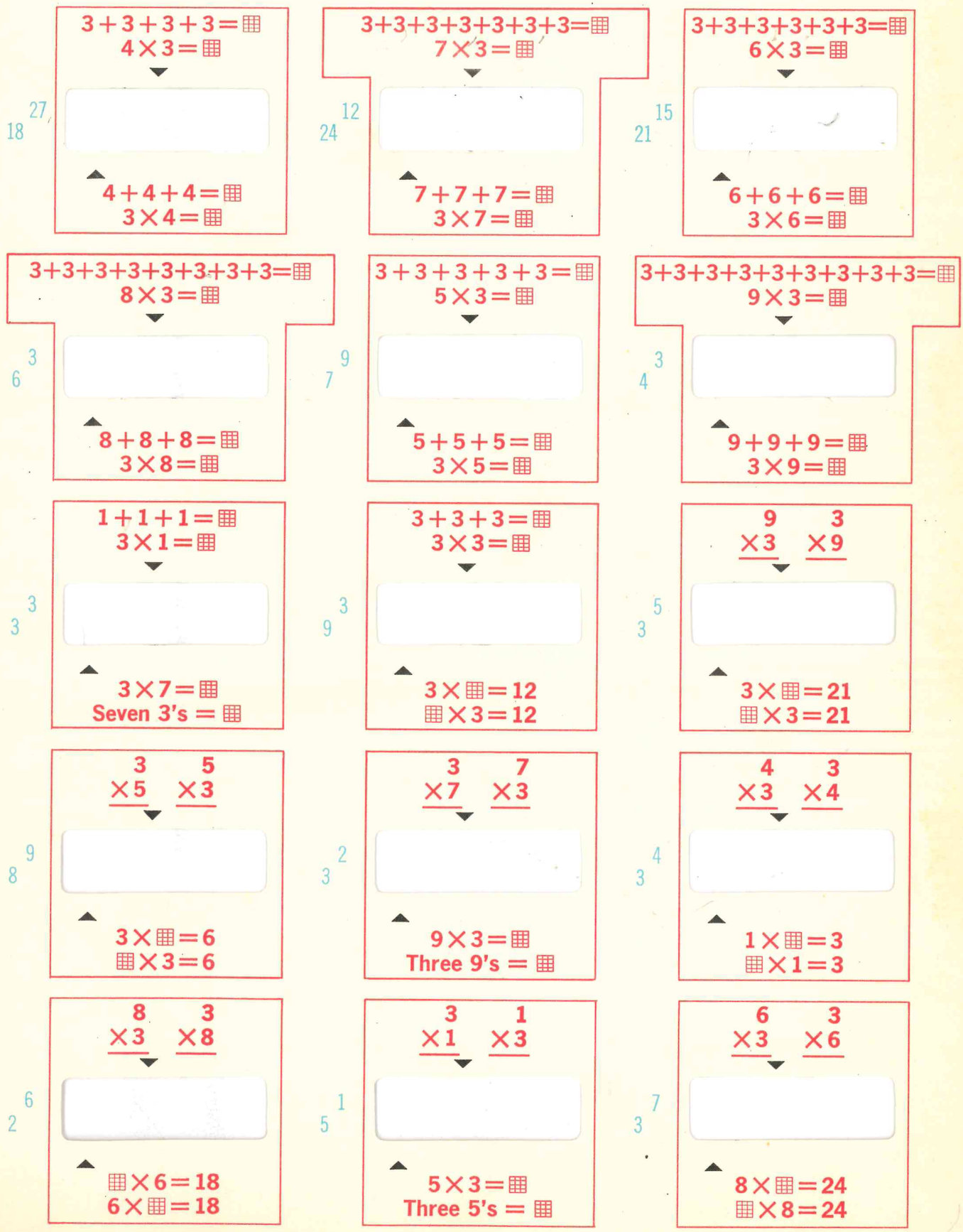
NOTE: Pay no attention to the red numerals outside the boxes.

DIRECTIONS: 1 — Study the examples on this page. The red numerals in the windows are the right answers.

2 — Put a piece of paper or a Magic Slate under this page. Write your answers through the windows where the arrows point.

(Both examples in each pair have the same answer, so you need only write it once.)

3 — To check your work, put your paper or Magic Slate under page 6. See if your answers are the same as the red numerals in the windows.

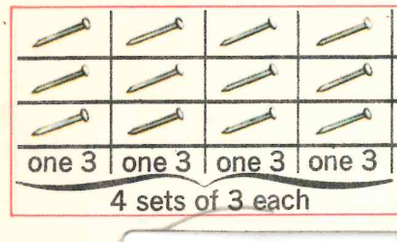


NOTE: Pay no attention to the blue numerals outside the boxes.

The Tool Shop
THE THREES IN MULTIPLICATION

This page is for study only. Study the panels below as you look at the examples on page 8.

A



$\begin{array}{r} 4 \\ \times 3 \\ \hline \square \end{array}$ $\begin{array}{r} 3 \\ \times 4 \\ \hline \square \end{array}$

Three 4's are ▦
Four 3's are ▦

10 / 18

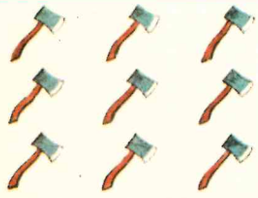
B

Three 1's are ▦ $3 \times 1 = \square$
One 3 is ▦ $1 \times 3 = \square$

16 / 8

6 / 14

C



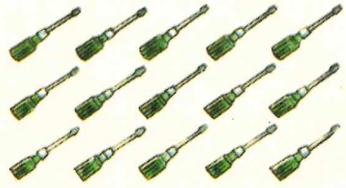
Three 3's are ▦

$\begin{array}{r} 3 \\ \times 3 \\ \hline \square \end{array}$

$3 \times 3 = \square$

12 / 2

D



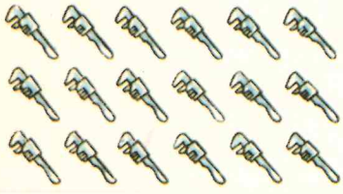
$\begin{array}{r} 5 \\ \times 3 \\ \hline \square \end{array}$ $\begin{array}{r} 3 \\ \times 5 \\ \hline \square \end{array}$

Three 5's are ▦
Five 3's are ▦

4 / 3

8 / 7

E

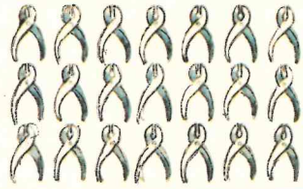


$\begin{array}{r} 6 \\ \times 3 \\ \hline \square \end{array}$ $\begin{array}{r} 3 \\ \times 6 \\ \hline \square \end{array}$

Three 6's are ▦
Six 3's are ▦

4 / 2

F



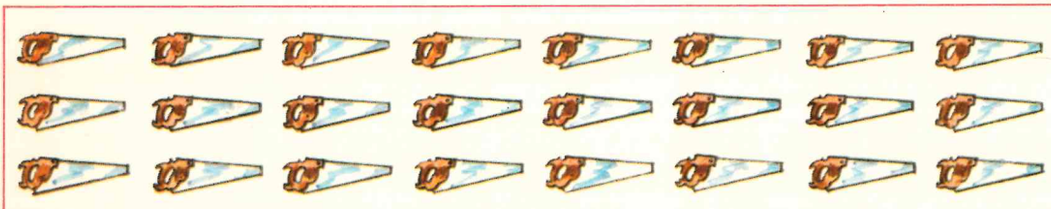
$\begin{array}{r} 7 \\ \times 3 \\ \hline \square \end{array}$ $\begin{array}{r} 3 \\ \times 7 \\ \hline \square \end{array}$

Three 7's are ▦
Seven 3's are ▦

2 / 5

3 / 2

G



$\begin{array}{r} 8 \\ \times 3 \\ \hline \square \end{array}$ $\begin{array}{r} 3 \\ \times 8 \\ \hline \square \end{array}$

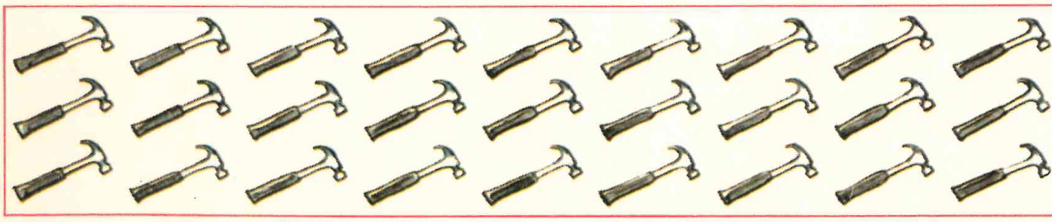
Three 8's are ▦
Eight 3's are ▦

7 / 2

9 / 2

2 / 1

H



$\begin{array}{r} 9 \\ \times 3 \\ \hline \square \end{array}$ $\begin{array}{r} 3 \\ \times 9 \\ \hline \square \end{array}$

Three 9's are ▦
Nine 3's are ▦

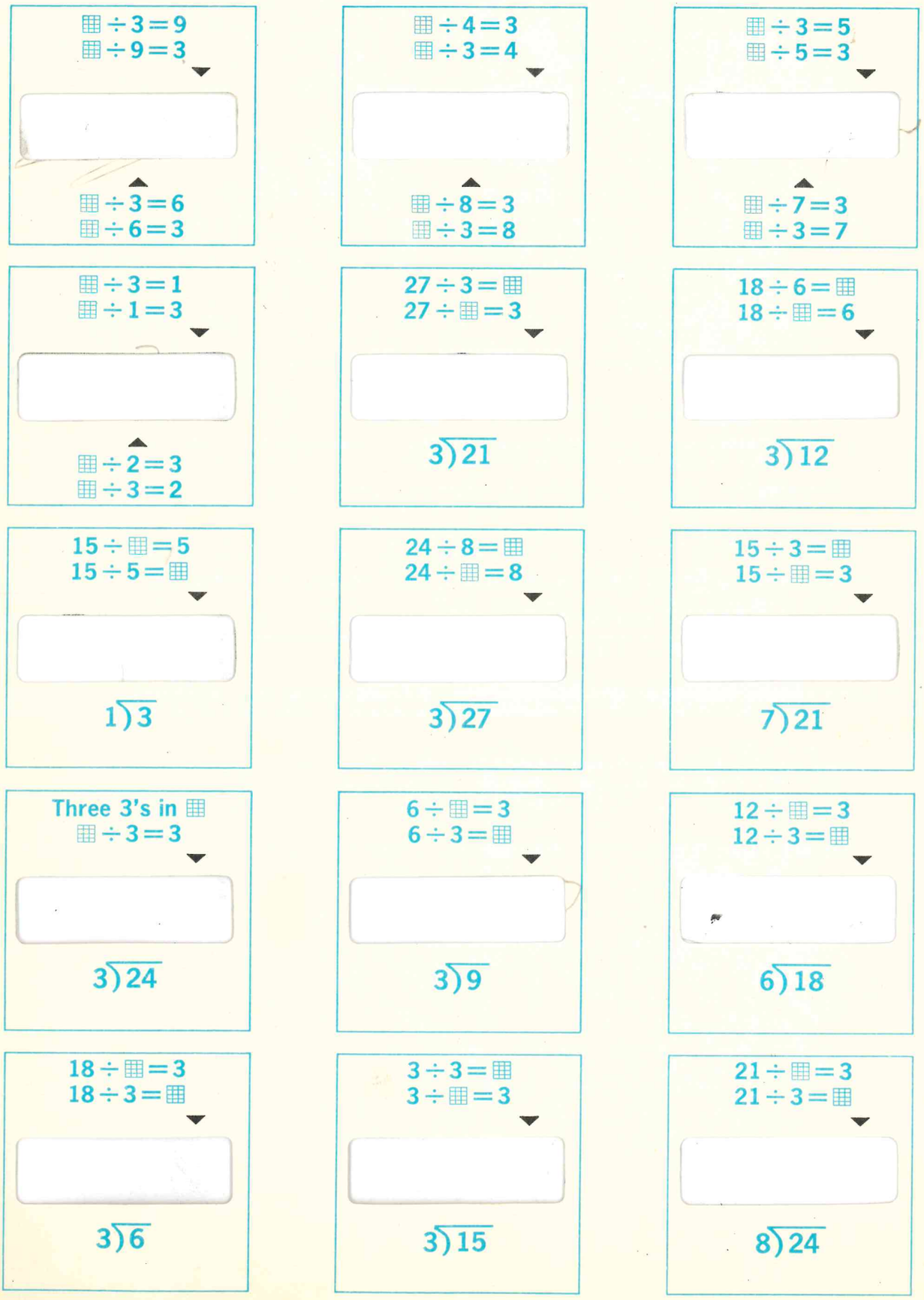
2 / 6

2 / 9

5 / 2

DIRECTIONS: 1 — Study the examples on this page. The blue numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers where the arrows point. For the examples below the windows, write your answers through the windows straight over the examples **or** where the arrows point.

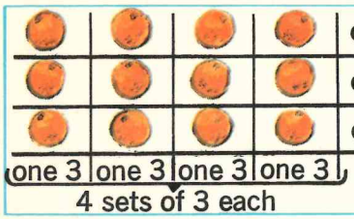
3 — To check your work, put your paper or Magic Slate under page 8. See if your answers are the same as the blue numerals in the windows.



The Fruit Store
THE THREES IN DIVISION

This page is for study only. Study the panels below as you look at the examples on page 10.

A



If you divided the 12 oranges equally among 3 friends, how many would each friend have?

$12 \div 3 = \square$

If you divided them equally among 4 friends, how many would each one have? $12 \div 4 = \square$

B

$3 \div 3 = \square$

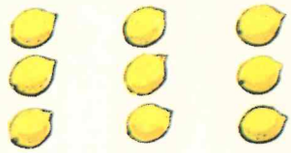
$3 \div 1 = \square$

How many 3's in 3?
How many 1's in 3?

C

$9 \div 3 = \square$

$3\overline{)9}$ $\square$



In 9 there are $\square$ threes.

D

$15 \div 3 = \square$

$15 \div 5 = \square$

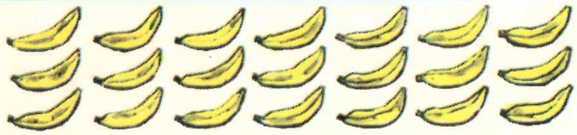
How many 3's in 15?
How many 5's in 15?

E

$3\overline{)18}$ $\square$ $\qquad$ $6\overline{)18}$ $\square$

How many 3's in 18? How many 6's in 18?

F

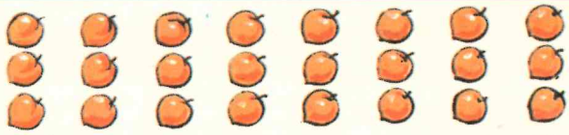


In 21 there are $\square$ 3's.
How many 7's in 21?

$21 \div 3 = \square$

$21 \div 7 = \square$

G



How many 3's in 24?
In 24 there are $\square$ 8's.

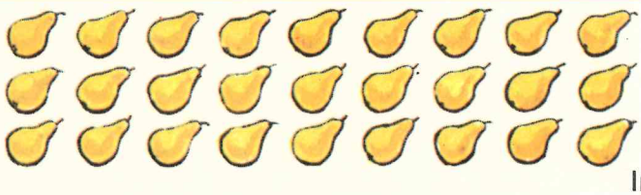
$24 \div 3 = \square$

$24 \div 8 = \square$

H

$27 \div 3 = \square$

$3\overline{)27}$ $\square$



$27 \div 9 = \square$

$9\overline{)27}$ $\square$

How many 3's in 27?

In 27 there are $\square$ nines.

TERMS; RELATED MULTIPLICATION AND DIVISION
THE TWOS AND THREES

A

Multiplication

$$\begin{array}{r} 4 \text{ Multiplicand} \\ \times 3 \text{ Multiplier} \\ \hline 12 \text{ Product} \end{array}$$

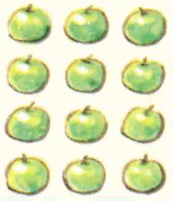
3 sets of 4 cups. 4 is called the **multiplicand** (the number multiplied).
3 is the **multiplier** (the number by which you multiply).
The answer in multiplication is called the **product**.
The 4 and 3 are sometimes called **factors**.

B

Multiplication and Division

Joe found 4 apples under each of 3 trees.

$3 \times 4 = 12$



He divided the 12 apples equally among 4 boys.

$12 \div 4 = 3$

3 apples for each boy.

C

An example with an **equals sign** (=) in it, such as $3 \times 4 = 12$, is called an **equation**. In Panel B, the equation $12 \div 4 = 3$ shows how Joe divided 12 apples into 4 groups with 3 apples in each group.

D

Terms Used in Division

$$\begin{array}{r} 3 \text{ Quotient} \\ \text{Divisor } 4\overline{)12} \text{ Dividend} \end{array}$$

E

Multiplication Related to Division

In the examples at the right, see how division "undoes" the multiplication equation.

$3 \times 4 = 12$

Product
Multiplicand
Multiplier

$12 \div 4 = 3$

Dividend
Divisor
Quotient

F

Does $4 \times 2 = 2 + 2 + 2 + 2$? The answer is yes. They name the same number.
That is, $4 \times 2 = 8$ and $2 + 2 + 2 + 2 = 8$
Does $5 \times 3 = 3 + 3 + 3 + 3 + 3$? Yes: $5 \times 3 = 15$ and $3 + 3 + 3 + 3 + 3 = 15$

Do you see that multiplication can be thought of as a short cut for addition?

▦ × 2 = 18 18 ÷ 2 = ▦ ▦ × 9 = 18 18 ÷ 9 = ▦	3 × ▦ = 18 18 ÷ ▦ = 3 6 × ▦ = 18 18 ÷ ▦ = 6	3 × ▦ = 6 6 ÷ ▦ = 3 2 × ▦ = 6 6 ÷ ▦ = 2
7 × ▦ = 14 14 ÷ ▦ = 7 2 × ▦ = 14 14 ÷ ▦ = 2	3 × ▦ = 24 24 ÷ ▦ = 3 8 × ▦ = 24 24 ÷ ▦ = 8	▦ × 4 = 12 12 ÷ 4 = ▦ ▦ × 3 = 12 12 ÷ 3 = ▦
▦ × 9 = 27 27 ÷ 9 = ▦ ▦ × 3 = 27 27 ÷ 3 = ▦	3 × ▦ = 3 3 ÷ ▦ = 3 1 × ▦ = 3 3 ÷ ▦ = 1	5 × ▦ = 15 15 ÷ ▦ = 5 3 × ▦ = 15 15 ÷ ▦ = 3
2 × ▦ = 8 8 ÷ ▦ = 2 4 × ▦ = 8 8 ÷ ▦ = 4	▦ × 5 = 10 10 ÷ 5 = ▦ ▦ × 2 = 10 10 ÷ 2 = ▦	2 × ▦ = 12 12 ÷ ▦ = 2 6 × ▦ = 12 12 ÷ ▦ = 6
▦ × 3 = 9 9 ÷ 3 = ▦ 2 × ▦ = 4 4 ÷ ▦ = 2	▦ × 8 = 16 16 ÷ 8 = ▦ ▦ × 2 = 16 16 ÷ 2 = ▦	3 × ▦ = 21 21 ÷ ▦ = 3 7 × ▦ = 21 21 ÷ ▦ = 7

DIRECTIONS: 1 — Study the examples on this page. The red numerals in the windows are the right answers.

2 — Put a piece of paper or a Magic Slate under this page. Write your answers through the windows where the arrows point.

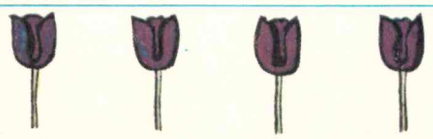
(Both examples in each pair have the same answer, so you need only write it once.)

3 — To check your work, put your paper or Magic Slate under page 15. See if your answers are the same as the red numerals in the windows.

The Flower Garden
THE FOURS IN MULTIPLICATION

32 20 | 28 12 | 4 5

A



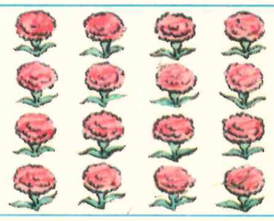
Four 1's are ▦
$4 \times 1 = ▦$

One 4 is ▦
$1 \times 4 = ▦$

B

Four 4's are ▦
$4 \times 4 = ▦$

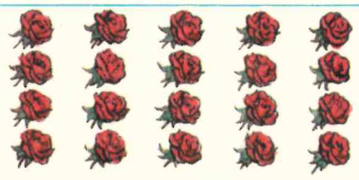
$$\begin{array}{r} 4 \\ \times 4 \\ \hline ▦ \end{array}$$



8 36 | 16 6 | 4 4

C

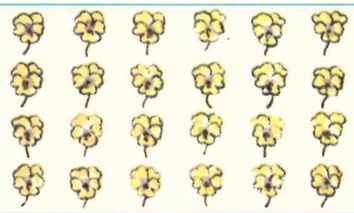
$$\begin{array}{r} 5 \\ \times 4 \\ \hline ▦ \end{array}$$



$$\begin{array}{r} 4 \\ \times 5 \\ \hline ▦ \end{array}$$

Four 5's are ▦ Five 4's are ▦

D



Six 4's are ▦
$6 \times 4 = ▦$

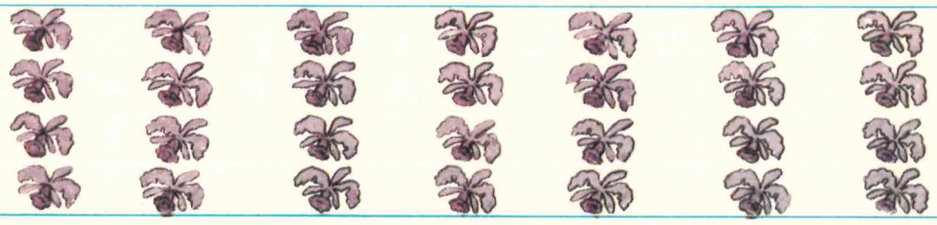
Four 6's are ▦
$4 \times 6 = ▦$

4 3 | 2 7 | 8 4

E

Seven 4's are ▦
$7 \times 4 = ▦$

$4 \times 7 = ▦$
Four 7's are ▦



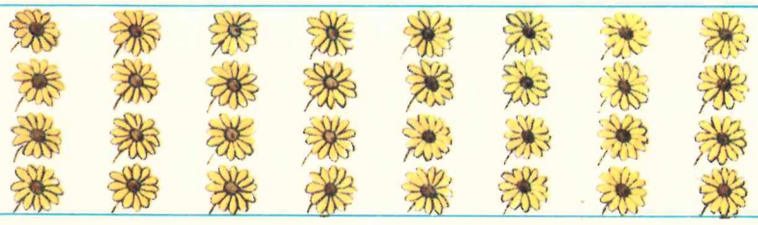
9 4 | 4 4 | 3 4

F

$8 \times 4 = ▦$

$$\begin{array}{r} 4 \\ \times 8 \\ \hline ▦ \end{array}$$

Eight 4's are ▦



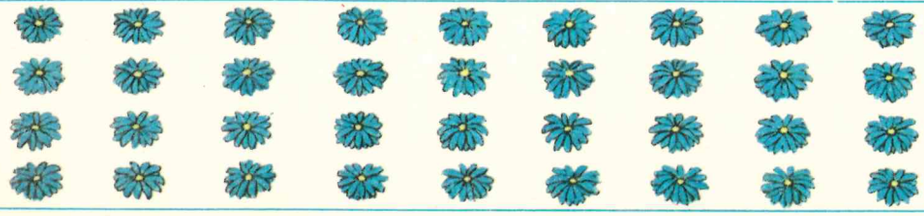
$4 \times 8 = ▦$

$$\begin{array}{r} 8 \\ \times 4 \\ \hline ▦ \end{array}$$

Four 8's are ▦

5 8 | 24 9 | 4 4

G

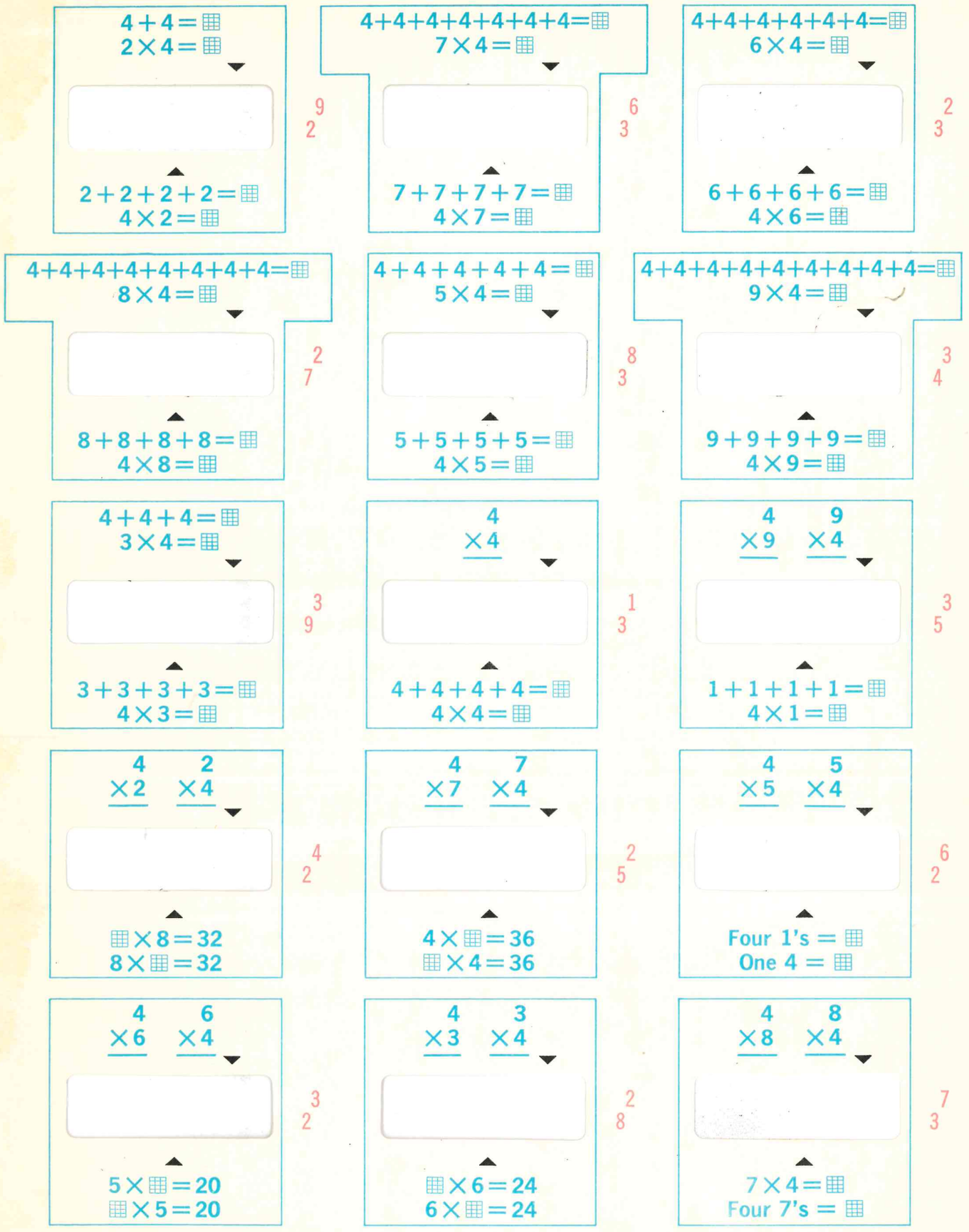


$9 \times 4 = ▦$
Nine 4's are ▦

$4 \times 9 = ▦$
Four 9's are ▦

This page is for study only. Study the panels above as you look at the examples on page 15.

 DO NOT write through the windows on this page.



DIRECTIONS: 1 — Study the examples on this page. The blue numerals in the windows are the right answers.

2 — Put a piece of paper or a Magic Slate under this page. Write your answers through the windows where the arrows point.

(Both examples in each pair have the same answer, so you need only write it once.)

3 — To check your work, put your paper or Magic Slate under page 17. See if your answers are the same as the blue numerals in the windows.

NOTE: Pay no attention to the red numerals outside the boxes.

▢÷8=4 ▢÷4=8 10 10 ▢÷4=5 ▢÷5=4	▢÷7=4 ▢÷4=7 35 35 ▢÷3=4 ▢÷4=3	▢÷4=1 ▢÷1=4 30 30 4)20
▢÷4=2 ▢÷2=4 40 40 ▢÷4=9 ▢÷9=4	Four 4's in ▢ ▢÷4=4 25 5 4)24	24÷▢=6 24÷6=▢ 45 45 9)36
28÷▢=7 28÷7=▢ 15 15 4)12	8÷▢=4 8÷4=▢ 20 20 4)28	32÷4=▢ 32÷▢=4 10 1 5)20
36÷▢=4 36÷4=▢ 30 25 1)4	4÷1=▢ 4÷▢=1 35 5 7)28	12÷▢=4 12÷4=▢ 5 5 4)16
20÷4=▢ 20÷▢=4 40 9 4)32	▢÷6=4 ▢÷4=6 15 4 4)36	32÷8=▢ 32÷▢=8 45 35 6)24

DIRECTIONS: 1 — Study the examples on this page. The red numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers where the arrows point. For the examples below the windows, write your answers through the windows straight over the examples **or** where the arrows point.

3 — To check your work, put your paper or Magic Slate under page 14. See if your answers are the same as the red numerals in the windows.

NOTE: Pay no attention to the blue numerals outside the boxes.

In the Classroom
THE FOURS IN DIVISION

8 28 24
8 28 24

A

$\square \overline{)4}$ $\square \overline{)4}$

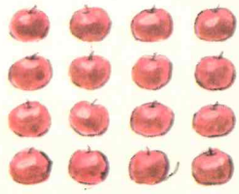
$4 \div 4 = \square$ $4 \div 1 = \square$

B

How many 4's in 16?

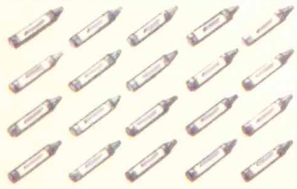
$16 \div 4 = \square$

$\square \overline{)16}$



32 20 36
32 20 36

C



How many 5's in 20?

$20 \div 5 = \square$

How many 4's in 20?

$20 \div 4 = \square$

D

How many 6's in 24?

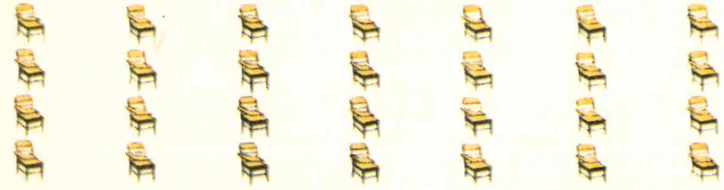
$24 \div 6 = \square$

How many 4's in 24?

$24 \div 4 = \square$

12 16 36
12 16 4

E



In 28 there are $\square$ 7's. $\square \overline{)28}$

In 28 there are $\square$ 4's. $\square \overline{)28}$

8 28 20
4 9 4

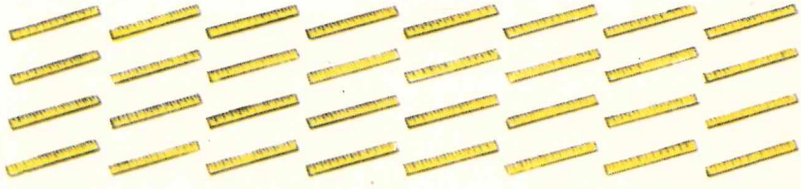
F

How many 4's in 32?

$32 \div 4 = \square$ $\square \overline{)32}$

How many 8's in 32?

$32 \div 8 = \square$ $\square \overline{)32}$



24 12 32
4 4 28

G

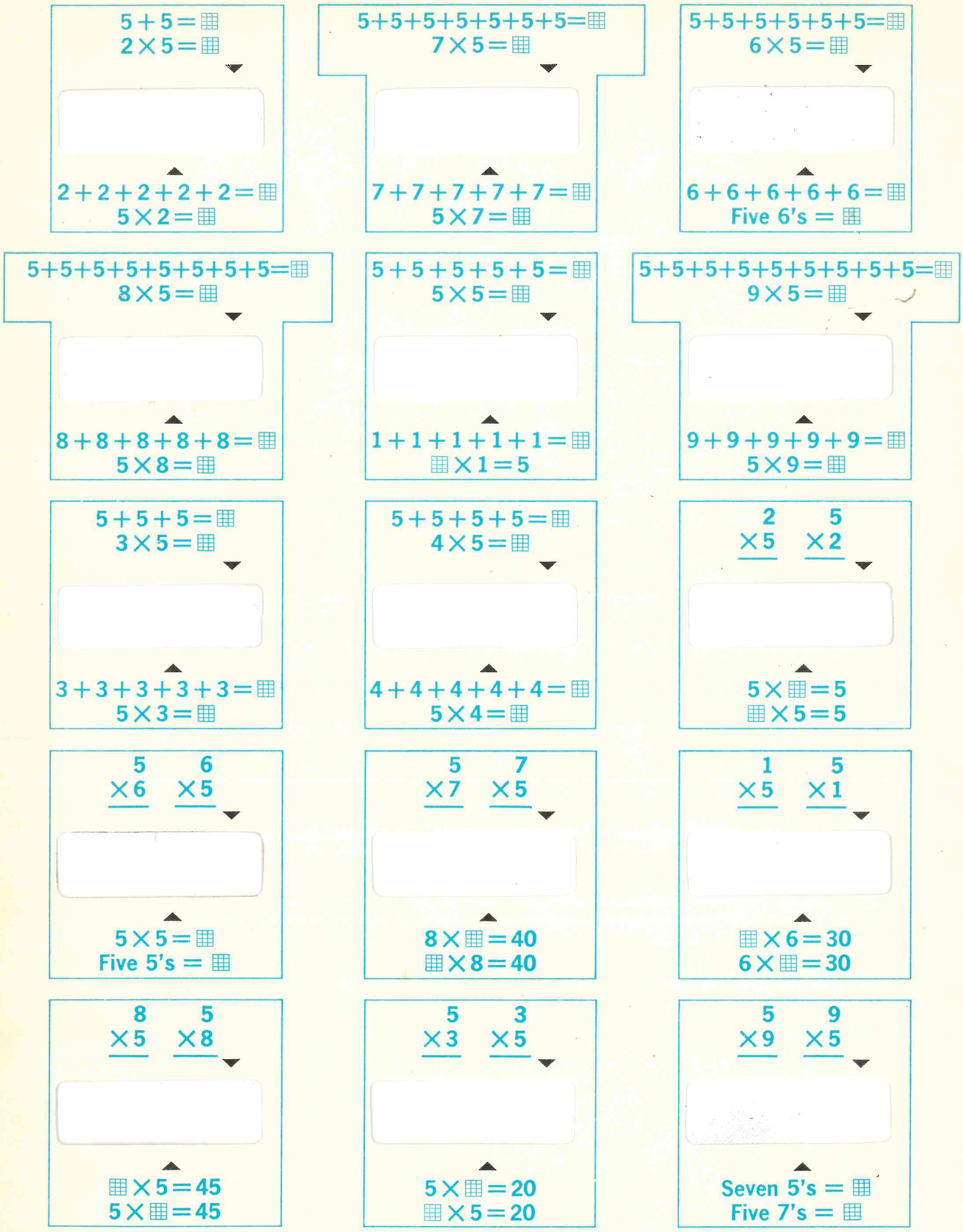
How many 9's are there in 36?

$36 \div 9 = \square$

How many 4's are there in 36?

$36 \div 4 = \square$

This page is for study only. Study the panels above as you look at the examples on page 16.
DO NOT write through the windows on this page.



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(Both examples in each pair have the same answer, so you need only write it once.)

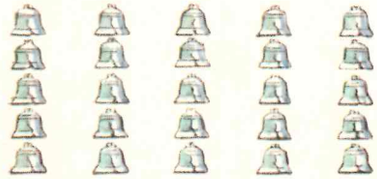
3 — To check your work, put your paper or Magic Slate under page 16. See if your answers are the same as the blue numerals in the windows.

Our United States
THE FIVES IN MULTIPLICATION

A

Five 1's are ▦
$5 \times 1 = ▦$

One 5 is ▦
$1 \times 5 = ▦$



$$\begin{array}{r} 5 \\ \times 5 \\ \hline ▦ \end{array}$$

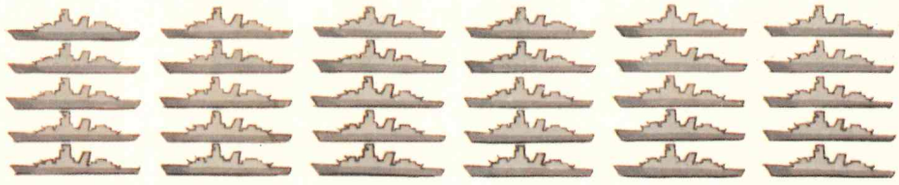
Five 5's are ▦

B

C

$$\begin{array}{r} 6 \\ \times 5 \\ \hline ▦ \end{array} \qquad \begin{array}{r} 5 \\ \times 6 \\ \hline ▦ \end{array}$$

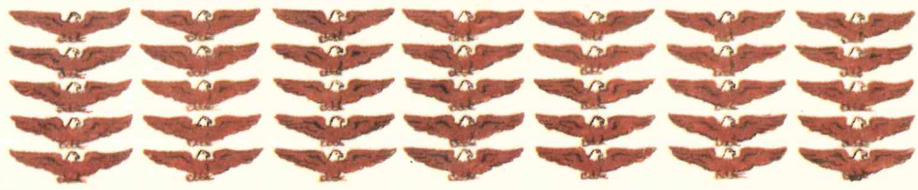
Five 6's = ▦
Six 5's = ▦



D

$5 \times 7 = ▦$
Five 7's = ▦

$7 \times 5 = ▦$
Seven 5's = ▦



E

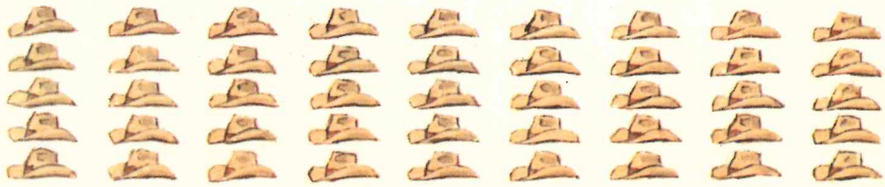
$$\begin{array}{r} 8 \\ \times 5 \\ \hline ▦ \end{array} \qquad \begin{array}{r} 5 \\ \times 8 \\ \hline ▦ \end{array}$$

Five 8's = ▦
Eight 5's = ▦

F

$5 \times 9 = ▦$
Five 9's = ▦

$9 \times 5 = ▦$
Nine 5's = ▦



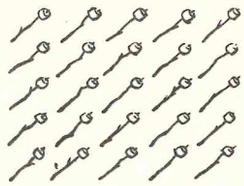
A Class Picnic
THE FIVES IN DIVISION

This page is for study only. Study the panels below as you look at the examples on page 21.

A

$5\overline{)5}$ $5 \div 5 = \square$ $5 \div 1 = \square$ $1\overline{)5}$

B

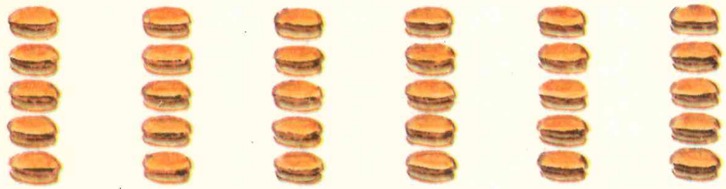


How many 5's in 25?

$25 \div 5 = \square$

$5\overline{)25}$

C



In 30 there are $\square$ 5's.
In 30 there are $\square$ 6's.

$30 \div 5 = \square$ $5\overline{)30}$ $30 \div 6 = \square$ $6\overline{)30}$

D

How many 5's in 35?
There are $\square$ 7's in 35.

$35 \div 5 = \square$ $5\overline{)35}$ $35 \div 7 = \square$ $7\overline{)35}$

E

$40 \div 5 = \square$ $5\overline{)40}$ $40 \div 8 = \square$ $8\overline{)40}$

In 40 there are $\square$ 5's.
How many 8's in 40?

F

$45 \div 5 = \square$ $5\overline{)45}$

$45 \div 9 = \square$ $9\overline{)45}$

DIRECTIONS: 1 — Study the examples on this page. The red numerals in the windows are the right answers.

2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers where the arrows point. For the examples below the windows, write your answers through the windows straight over the examples.

3 — To check your work, put your paper or Magic Slate under page 23. See if your answers are the same as the red numerals in the windows.

45 ÷ ▦ = 5 45 ÷ 5 = ▦ 4)20	10 ÷ 2 = ▦ 10 ÷ ▦ = 2 5)15	▦ ÷ 4 = 5 ▦ ÷ 5 = 4 5)10
15 ÷ ▦ = 3 15 ÷ 3 = ▦ 6)30	30 ÷ 6 = ▦ 30 ÷ ▦ = 6 5)45	40 ÷ ▦ = 5 40 ÷ 5 = ▦ 5)20
▦ ÷ 5 = 7 ▦ ÷ 7 = 5 8)40	▦ ÷ 5 = 1 5 ÷ 1 = ▦ 3)15	▦ ÷ 5 = 5 Five 5's in ▦ 7)35
40 ÷ ▦ = 8 40 ÷ 8 = ▦ 2)10	45 ÷ 9 = ▦ 45 ÷ ▦ = 9 5)35	▦ ÷ 5 = 2 ▦ ÷ 2 = 5 5)30
▦ ÷ 5 = 3 ▦ ÷ 3 = 5 5)25	35 ÷ ▦ = 7 35 ÷ 7 = ▦ 5)40	▦ ÷ 5 = 6 ▦ ÷ 6 = 5 9)45

NUMBER FAMILIES
RELATED MULTIPLICATION AND DIVISION OF FOURS AND FIVES

This page is for study only. Study the panels below as you look at the examples on page 23.

A

I know the members of my family are closely related. I know there are closely related members of number families, too.

A Number Family

$4 \times 5 = 20$ $5 \times 4 = 20$

$20 \div 5 = 4$ $20 \div 4 = 5$

122 4 | 162 0 | 186 1

B

Two members of another number family are 4 and 6. I know $4 \times 6 = 24$, so I can figure out the other equations in this number family.

$4 \times 6 = 24$ $6 \times 4 = 24$

$24 \div 6 = 4$ $24 \div 4 = 6$

108 0 | 140 5 | 84 1

C

I am thinking of the number family 4 and 8. $4 \times 8 = 34$

No, Fred, $4 \times 8 = 32$!

$4 \times 8 = 32$ $8 \times 4 = 32$

$32 \div 8 = 4$ $32 \div 4 = 8$

166 0 | 184 9 | 120 0

D

Study these number families

(a) $5 \times 7 = 35$ $7 \times 5 = 35$ $35 \div 7 = 5$ $35 \div 5 = 7$

(b) $5 \times 9 = 45$ $9 \times 5 = 45$ $45 \div 9 = 5$ $45 \div 5 = 9$

(c) $4 \times 7 = 28$ $7 \times 4 = 28$ $28 \div 7 = 4$ $28 \div 4 = 7$

104 1 | 82 0 | 148 0

E

(d) $5 \times 6 = 30$ $6 \times 5 = 30$ $30 \div 6 = 5$ $30 \div 5 = 6$

(e) $4 \times 9 = 36$ $9 \times 4 = 36$ $36 \div 9 = 4$ $36 \div 4 = 9$

(f) $5 \times 8 = 40$ $8 \times 5 = 40$ $40 \div 8 = 5$ $40 \div 5 = 8$

188 0 | 160 0 | 126 8

DIRECTIONS: 1 — Study the examples on this page. The blue numerals in the windows are the right answers.

2 — Put a piece of paper or a Magic Slate under this page. Write your answers through the windows where the arrows point.

(Both examples in each pair have the same answer, so you need only write it once.)

3 — To check your work, put your paper or Magic Slate under page 25. See if your answers are the same as the blue numerals in the windows.

4 × 9 = ▦ ▦ ÷ 9 = 4 ▦ × 4 = 36 36 ÷ 4 = ▦	9 5	4 × ▦ = 4 4 ÷ ▦ = 4 1 × 4 = ▦ 4 ÷ ▦ = 1	5 3	4 × ▦ = 28 28 ÷ ▦ = 4 7 × ▦ = 28 28 ÷ ▦ = 7	20 2
▦ × 8 = 32 32 ÷ 8 = ▦ 8 × 4 = ▦ ▦ ÷ 4 = 8	5 5	4 × ▦ = 24 24 ÷ ▦ = 4 6 × ▦ = 24 24 ÷ ▦ = 6	5 9	▦ × 4 = 16 16 ÷ ▦ = 4 5 × 5 = ▦ ▦ ÷ 5 = 5	8 4
▦ × 5 = 20 20 ÷ 5 = ▦ 5 × 4 = ▦ ▦ ÷ 4 = 5	35 5	9 × ▦ = 36 36 ÷ ▦ = 9 4 × ▦ = 36 36 ÷ ▦ = 4	5 5	▦ × 6 = 30 30 ÷ 6 = ▦ 6 × 5 = ▦ ▦ ÷ 5 = 6	25 5
5 × 8 = ▦ ▦ ÷ 8 = 5 ▦ × 5 = 40 40 ÷ 5 = ▦	5 5	▦ × 1 = 5 5 ÷ 1 = ▦ ▦ × 5 = 5 5 ÷ 5 = ▦	5 7	5 × ▦ = 35 35 ÷ ▦ = 5 7 × 5 = ▦ ▦ ÷ 5 = 7	10 6
▦ × 5 = 30 30 ÷ 5 = ▦ 5 × 6 = ▦ ▦ ÷ 6 = 5	15 5	4 × 7 = ▦ ▦ ÷ 7 = 4 ▦ × 4 = 28 28 ÷ 4 = ▦	5 8	5 × 9 = ▦ ▦ ÷ 9 = 5 ▦ × 5 = 45 45 ÷ 5 = ▦	30 5

NOTE: Pay no attention to the red numerals outside the boxes

DIRECTIONS: 1 — Study the examples on this page. The red numerals in the windows are the right answers.

2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples. For the examples below the windows, write your answers where the arrows point.

3 — To check your work, put your paper or Magic Slate under page 22. See if your answers are the same as the red numerals in the windows.

61 × 2 172 8 4×1=▦ 1×▦=4	81 × 2 154 2 6×0=▦ ▦×6=0	93 × 2 66 18 6×▦=6 ▦×6=6
54 × 2 110 8 0×2=▦ 2×▦=0	70 × 2 96 2 ▦×1=5 1×5=▦	42 × 2 48 12 ▦×7=7 7×▦=7
83 × 2 63 2 8×0=▦ 0×8=▦	92 × 2 130 14 Nine 1's=▦ 1×▦=9	60 × 2 60 2 ▦×4=0 4×▦=0
52 × 2 132 5 1×1=▦ One▦=1	41 × 2 84 18 3×▦=0 ▦×3=0	74 × 2 158 2 ▦×9=0 9×▦=0
94 × 2 80 14 7×▦=0 ▦×7=0	80 × 2 72 2 5×▦=0 ▦×5=0	63 × 2 198 16 Eight 1's=▦ 1×▦=8

NOTE: Pay no attention to the blue numerals outside the boxes.

Baseball
ZEROS, ONES, TWOS – MULTIPLYING 2-DIGIT NUMERALS

This page is for study only. Study the panels below as you look at the examples on page 24.

A

In 9 innings the Reds made no runs.
Their score was 0 runs. 0 is called **zero**.
9 × 0 runs = 0 runs

$9 \times 0 = \square$ $0 \times 9 = \square$

$$\begin{array}{r} 0 \\ \times 9 \\ \hline \square \end{array} \qquad \begin{array}{r} 9 \\ \times 0 \\ \hline \square \end{array}$$

B

Six children had no bats.
$6 \times 0 = 0 + 0 + 0 + 0 + 0 + 0$

Any number times zero is zero.
Zero times any number is zero.

$6 \times 0 = \square$ $0 \times 6 = \square$

C

There are 3 balls in the picture.
1 ball + 1 ball + 1 ball = 3 balls
1 set of 3 balls = 3 balls

$3 \times 1 = 3$
$1 \times 3 = 3$

If a number is multiplied by 1, the product is the same as the number.

D

Study this example

TENS	ONES	
6	4 =	60 + 4
× 2 =		× 2
8		120 + 8 = 128

Step 1

Multiply the ONES: 2 × 4 ONES = 8 ONES
Write 8 in ONES place. 1 1 1 1 | 1 1 1 1
Multiply the TENS: 2 × 6 TENS = 12 TENS
(Remember 12 TENS.) 10 10 10 10 10 10 | 10 10 10 10 10 10

E

HUNDREDS	TENS	ONES
	6	4
	×	2
1	2	8

Step 2

12 TENS = 1 HUNDRED + 2 TENS = 100 + 20
10 10 10 10 10 10 10 10 10 10 + 10 10 = 100 + 10 10
Write 2 in TENS place and 1 in HUNDREDS place.

DIRECTIONS: 1 — Study the examples on this page. The blue numerals in the windows are the right answers.
2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples. For the examples below the windows, write your answers where the arrows point.
3 — To check your work, put your paper or Magic Slate under page 24. See if your answers are the same as the blue numerals in the windows.

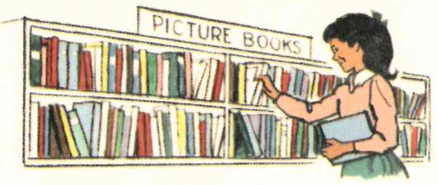
86 × 2 4 × 2 = ▦ (1 + 3) × 2 = ▦	22 × 7 3 × ▦ = 6 (▦ + 1) × 2 = 6	22 × 3 9 × 2 = ▦ (4 + 5) × 2 = ▦
22 × 5 2 × ▦ = 16 ▦ × 2 = 16	12 × 8 7 × ▦ = 14 (▦ + 5) × 2 = 14	12 × 4 6 × 2 = ▦ (5 + 1) × 2 = ▦
21 × 3 9 × ▦ = 18 (7 + ▦) × 2 = 18	65 × 2 2 × 7 = ▦ Two 7's = ▦	12 × 5 8 × ▦ = 16 (2 + 6) × ▦ = 16
22 × 6 2 × ▦ = 10 ▦ × 2 = 10	12 × 7 Two 9's = ▦ 2 × 9 = ▦	79 × 2 6 × ▦ = 12 (2 + 4) × ▦ = 12
20 × 4 7 × 2 = ▦ (3 + 4) × 2 = ▦	12 × 6 2 × ▦ = 4 (1 + 1) × ▦ = 4	22 × 9 8 × 2 = ▦ (2 + 6) × 2 = ▦

THE TWOS – MULTIPLYING 2-DIGIT NUMERALS; CARRYING

This page is for study only. Study the panels below as you look at the examples on page 26.

A

There were 2 shelves of picture books with 67 books on each shelf. How many picture books were there on the 2 shelves?



67 Multiplicand
× 2 Multiplier
} Factors
Product

B

TENS	ONES
6	7 = 60 + 7
×	2 × 2
	120 + 14 = 134

Here is one way to work the example. Panels C and D will show you a shorter way.

C

HUNDREDS	TENS	ONES
	1	
	6	7
	×	2
		4

Step 1 Multiply the ONES: 2 × 7 ONES = 14 ONES
14 ONES = 1 TEN + 4 ONES. Write 4 in ONES place.
Put the 1 TEN with the 6 TENS.
We call this **carrying** the TEN.
Remember the 1 TEN; do not write it in this book.

D

HUNDREDS	TENS	ONES
	1	
	6	7
	×	2
1	3	4

Step 2 Multiply the TENS: 2 × 6 TENS = 12 TENS
Add the 1 TEN you carried: 12 TENS + 1 TEN = 13 TENS
13 TENS = 1 HUNDRED + 3 TENS.
Write 3 in TENS place and 1 in HUNDREDS place.
The product of 2 × 67 is 134.

E

In the equation 6 × 2 = 12, 6 and 2 are the factors.
We can rename the factors in many ways:

$6=(1+5)$ $6=(5+1)$ $6=(4+2)$ $6=(2+4)$ $6=(3+3)$

Renaming the factors does not change the product:

$6\times2=12$ $(2+4)\times2=12$ $(5+1)\times2=12$ $(3+3)\times2=12$

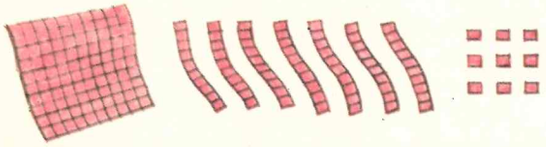
THE TWOS – MULTIPLYING 2- AND 3-DIGIT NUMERALS; CARRYING

A

Sue and Billy are collecting stamps. Each has 179. How many have they collected altogether?

$$\begin{array}{r} 179 \\ \times\ 2 \\ \hline \square \end{array}$$

B



1 HUNDRED 7 TENS 9 ONES

HUNDREDS	TENS	ONES
1	7	9
	×	2

$1\,79 = 100 + 70 + 9$

$\times\ 2$

$200 + 140 + 18 = 358$

C

HUNDREDS	TENS	ONES
	1	
1	7	9
	×	2
		8

Step 1

First, multiply the ONES: 2×9 ONES $= 18$ ONES
18 ONES $= 1$ TEN $+ 8$ ONES. Write 8 in ONES place and carry 1 TEN.
Multiply the TENS: 2×7 TENS $= 14$ TENS
Add the 1 TEN you carried: 14 TENS $+$ 1 TEN $= 15$ TENS

D

HUNDREDS	TENS	ONES
1	1	
1	7	9
	×	2
3	5	8

Step 2

15 TENS $= 1$ HUNDRED $+ 5$ TENS.
Write 5 in TENS place and carry 1 HUNDRED.
Multiply the HUNDREDS: 2×1 HUNDRED $= 2$ HUNDREDS
Add the 1 HUNDRED you carried: 2 HUNDREDS $+$ 1 HUNDRED $= 3$ HUNDREDS Write 3 in HUNDREDS place.

E

Remember, in multiplication we can rename factors without changing the product.

(a)	(b)	(c)	(d)
$2 \times 7 = 14$	$2 \times 8 = 16$	$2 \times 6 = 12$	$2 \times 9 = 18$
$2 \times (5 + 2) = 14$	$2 \times (4 + 4) = 16$	$2 \times (4 + 2) = 12$	$2 \times (3 + 6) = 18$

In (a), $(5 + 2)$ is another name for 7; in (b), $(4 + 4) = 8$ Note (c) and (d) also.

495 × 2 = ▢ ▲ 2×8=▢ 2×(6+2)=▢	102 × 9 = ▢ ▲ 2×▢=18 ▢×2=18	122 × 6 = ▢ ▲ ▢×4=8 2×(▢+2)=8
21 × 4 = ▢ ▲ 6×2=▢ (5+1)×2=▢	112 × 7 = ▢ ▲ ▢×5=10 2×(▢+3)=10	120 × 3 = ▢ ▲ ▢×2=14 2×▢=14
102 × 6 = ▢ ▲ 2×9=▢ 2×(5+4)=▢	386 × 2 = ▢ ▲ Eight 2's=▢ 8×2=▢	122 × 5 = ▢ ▲ 2×▢=4 ▢×(1+1)=4
112 × 8 = ▢ ▲ Three 2's=▢ 2×3=▢	202 × 4 = ▢ ▲ ▢×7=14 2×(5+▢)=14	20 × 3 = ▢ ▲ ▢×6=12 2×(4+▢)=12
120 × 7 = ▢ ▲ ▢×9=18 2×(▢+7)=18	122 × 8 = ▢ ▲ 2×6=▢ 2×(3+3)=▢	278 × 2 = ▢ ▲ ▢×1=2 1×▢=2

DIRECTIONS: 1 — Study the examples on this page. The red numerals in the windows are the right answers.

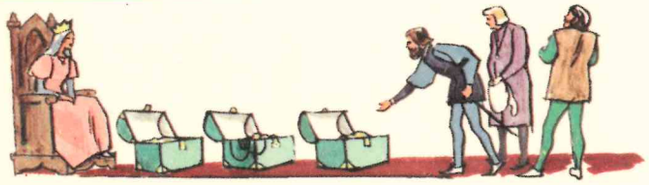
2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples. For the examples below the windows, write your answers where the arrows point.

3 — To check your work, put your paper or Magic Slate under page 31. See if your answers are the same as the red numerals in the windows.

Columbus Day
THE THREES — MULTIPLYING 2-DIGIT NUMERALS

40 × 21	7 × 27	80 × 6

A



Queen Isabella sold 3 boxes of jewels to help Columbus. If each box contained 23 rings, how many rings did she sell?

177 × 3	150 × 6	256 × 9

B

TENS	ONES
2	3
×	3
6	9

Multiply the ONES: 3 × 3 ONES = 9 ONES
Write 9 in ONES place.
Multiply the TENS: 3 × 2 TENS = 6 TENS
Write 6 in TENS place.
The product is 69.

186 × 3	78 × 21	91 × 15

C

If 50 barrels of fresh water were put on each of Columbus' ships, how many barrels of water were put on the 3 ships?

9 × 4	50 × 24	300 × 3

D

HUNDREDS	TENS	ONES
	5	0
	×	3
1	5	0

Multiply the ONES: 3 × 0 ONES = 0 ONES
Write 0 in ONES place.
Multiply the TENS: 3 × 5 TENS = 15 TENS
15 TENS = 1 HUNDRED and 5 TENS.
Write 5 in TENS place and 1 in HUNDREDS place.

132 × 2	207 × 3	117 × 8

E

Multiplying TENS, HUNDREDS, and THOUSANDS is like multiplying ONES.

2 × 2 ONES = 4 ONES = 4	2 × 4 = 8
2 × 2 TENS = 4 TENS = 40	2 × 40 = 80
2 × 2 HUNDREDS = 4 HUNDREDS = 400	2 × 400 = 800
2 × 2 THOUSANDS = 4 THOUSANDS = 4000	2 × 4000 = 8000

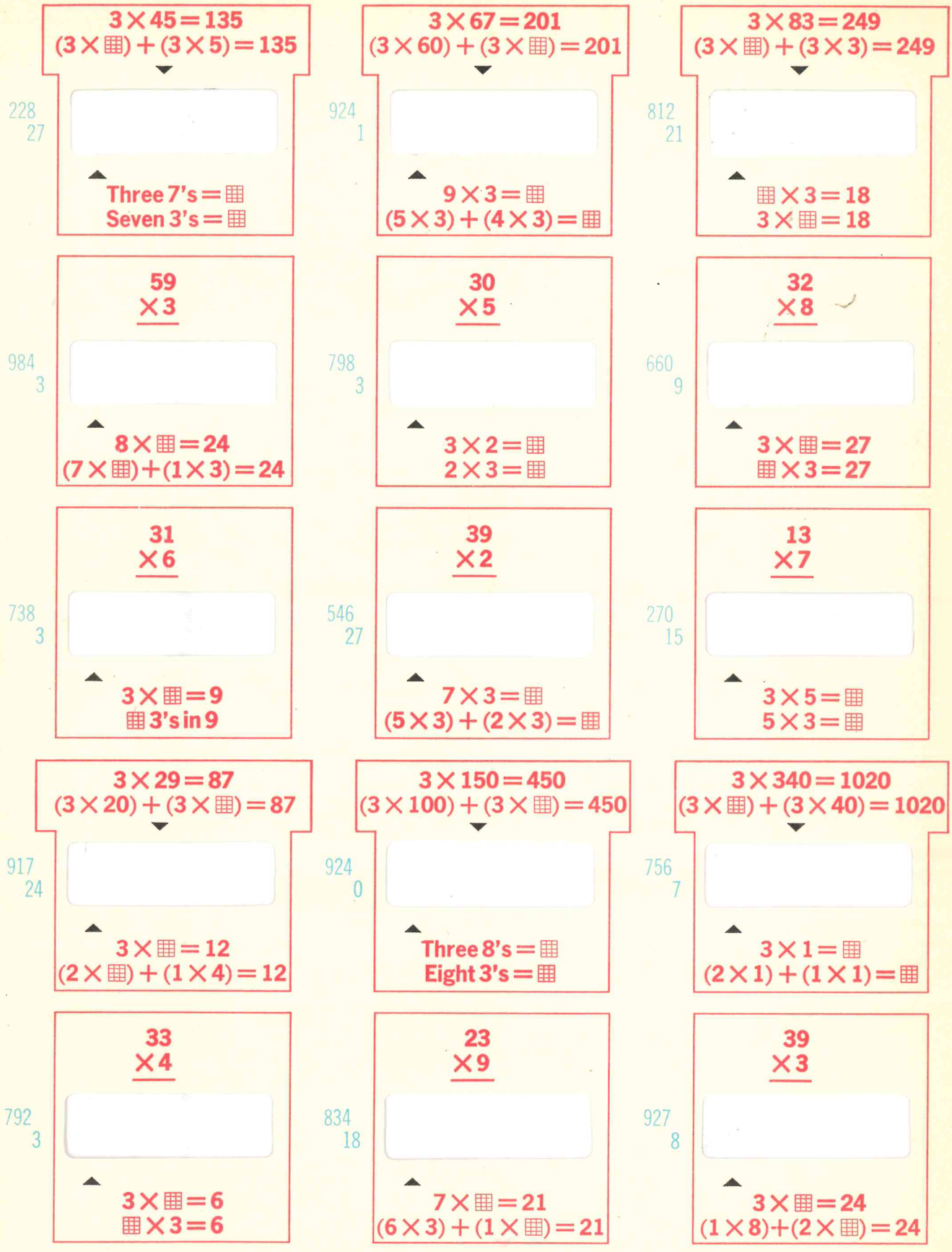
This page is for study only. Study the panels above as you look at the examples on page 31.
DO NOT write through the windows on this page.

	40 × 3 = ▢ 3 × ▢ = 27 ▢ × 3 = 27 990 16	63 × 3 = ▢ ▢ × 4 = 12 4 × ▢ = 12 918 9	90 × 3 = ▢ 3 × ▢ = 18 ▢ × 3 = 18 732 2
	71 × 3 = ▢ ▢ × 3 = 24 3 × ▢ = 24 84 12	12 × 3 = ▢ Three 4's = ▢ Four 3's = ▢ 784 2	81 × 3 = ▢ 3 × 7 = ▢ 7 × 3 = ▢ 360 7
3 × 2	3 × 20 = ▢ ▢ × 3 = 15 3 × ▢ = 15 612 18	3 × 200 = ▢ Six 3's = ▢ Three 6's = ▢ 772 16	3 × 2000 = ▢ ▢ × 9 = 27 9 × ▢ = 27 610 2
	70 × 3 = ▢ 3 × 8 = ▢ 8 × 3 = ▢ 896 6	52 × 3 = ▢ 1 × 3 = ▢ 3 × 1 = ▢ 808 2	61 × 3 = ▢ 5 × 3 = ▢ 3 × 5 = ▢ 60 2
3 × 3	3 × 30 = ▢ 7 × ▢ = 21 ▢ × 7 = 21 840 2	3 × 300 = ▢ 3 × 9 = ▢ 9 × 3 = ▢ 976 12	3 × 3000 = ▢ 2 × 3 = ▢ Two 3's = ▢ 556 2

DIRECTIONS: 1 — Study the examples on this page. The blue numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples **or** where the arrows point. For the examples below the windows, write your answers where the arrows point.

3 — To check your work, put your paper or Magic Slate under page 33. See if your answers are the same as the blue numerals in the windows.

NOTE: Pay no attention to the red numerals outside the boxes.



DIRECTIONS: **1** — Study the examples on this page. The red numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples **or** where the arrows point. For the examples below the windows, write your answers where the arrows point.

3 — To check your work, put your paper or Magic Slate under page 30. See if your answers are the same as the red numerals in the windows.

NOTE: Pay no attention to the blue numerals outside the boxes.

In a Large Restaurant
THE THREES – MULTIPLYING 2-DIGIT NUMERALS; CARRYING

120 / 9 ____ 189 / 3 ____ 270 / 6 ____

A

There were thirteen waiters in each of four dining rooms. How many waiters were there in all?

$$\begin{array}{r} 13 \\ \times 4 \\ \hline \square \end{array}$$

213 / 8 ____ 36 / 12 ____ 243 / 21 ____

B

TENS	ONES
1	3 = 10 + 3
× 4	× 4
	40 + 12 = 52

Panel C will show you the short way to work the example.

60 / 5 ____ 600 / 18 ____ 6000 / 3 ____

C

TENS	ONES
1	
1	3
×	4
5	2

Multiply the ONES: $4 \times 3 = 12$ 12 ONES = 1 TEN + 2 ONES.
Write 2 in ONES place and carry 1 TEN.
Multiply the TENS: 4×1 TEN = 4 TENS (40)
Add the 1 TEN you are carrying: 4 TENS + 1 TEN = 5 TENS (50)
Write 5 in TENS place. There were 52 waiters in all.

210 / 24 ____ 156 / 3 ____ 183 / 15 ____

D

$$\begin{array}{r} 80 + 9 \\ \times 3 \\ \hline 240 + 27 \end{array}$$

$$\begin{aligned} 3 \times 89 &= 3 \times (80 + 9) \\ &= \underbrace{(3 \times 80)}_{240} + \underbrace{(3 \times 9)}_{27} \\ &= 267 \end{aligned}$$

E

$$\begin{array}{r} 120 \\ \times 3 \\ \hline 360 \end{array}$$

$$\begin{aligned} 3 \times 120 &= 3 \times (100 + 20) \\ &= \underbrace{(3 \times 100)}_{300} + \underbrace{(3 \times 20)}_{60} \\ &= 360 \end{aligned}$$

90 / 3 ____ 900 / 27 ____ 9000 / 6 ____

F

Remember: in multiplication we can rename factors. The product will be the same.

$$\begin{aligned} 4 \times 3 &= 12 \\ (2+2) \times 3 &= 12 \\ \underbrace{(2 \times 3)}_{6} + \underbrace{(2 \times 3)}_{6} &= 12 \end{aligned}$$

$$\begin{aligned} 3 \times 55 &= 165 \\ 3 \times (50+5) &= 165 \\ \underbrace{(3 \times 50)}_{150} + \underbrace{(3 \times 5)}_{15} &= 165 \end{aligned}$$

$$\begin{aligned} 3 \times 76 &= 228 \\ 3 \times (70+6) &= 228 \\ \underbrace{(3 \times 70)}_{210} + \underbrace{(3 \times 6)}_{18} &= 228 \end{aligned}$$

This page is for study only. Study the panels above as you look at the examples on page 32.
DO NOT write through the windows on this page.

76 × 3 Nine 3's = ▦ Three 9's = ▦	132 × 7 3 × ▦ = 3 ▦ × 3 = 3	203 × 4 3 × 7 = ▦ (3 × 4) + (3 × 3) = ▦
123 × 8 8 × ▦ = 24 ▦ × 8 = 24	133 × 6 ▦ × 5 = 15 (3 × 4) + (▦ × 1) = 15	132 × 5 3 × ▦ = 27 ▦ × 3 = 27
246 × 3 ▦ × 6 = 18 6 × ▦ = 18	273 × 2 9 × 3 = ▦ (9 × 2) + (9 × 1) = ▦	30 × 9 Five 3's = ▦ Three 5's = ▦
131 × 7 3 × 8 = ▦ (3 × 5) + (3 × 3) = ▦	231 × 4 Three 0's = ▦ ▦ × 3 = 0	378 × 2 3 × ▦ = 21 ▦ × 3 = 21
132 × 6 ▦ × 9 = 27 (3 × 6) + (3 × ▦) = 27	278 × 3 Three 6's = ▦ 6 × 3 = ▦	103 × 9 ▦ × 3 = 24 (▦ × 1) + (8 × 2) = 24

DIRECTIONS: 1 — Study the examples on this page. The blue numerals in the windows are the right answers.

2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples. For the examples below the windows, write your answers where the arrows point.

3 — To check your work, put your paper or Magic Slate under page 32. See if your answers are the same as the blue numerals in the windows.

THE THREES – MULTIPLYING 2- AND 3-DIGIT NUMERALS; CARRYING

A

Things to Remember

10 ONES	= 1 TEN	10 TENS	= 1 HUNDRED

B

If Morris sells 178 newspapers each day, how many papers will he sell in 3 days?

$$\begin{array}{r} 178 \\ \times\ 3 \\ \hline \end{array}$$

C

HUNDREDS	TENS	ONES
2	2	
1	7	8
	×	3
	3	4

Step 1

First, multiply the ONES: $3 \times 8 = 24$
Write 4 in ONES place and carry 2 TENS.
Multiply the TENS: $3 \times 7 = 21$
Add the 2 TENS you carried: $21 + 2 = 23$
Write 3 in TENS place and carry 2 HUNDREDS.

D

HUNDREDS	TENS	ONES
2	2	
1	7	8
	×	3
5	3	4

Step 2

Multiply the HUNDREDS: $3 \times 1 = 3$
Add the 2 HUNDREDS you carried: $3 + 2 = 5$
Write 5 in HUNDREDS place.
Morris will sell 534 newspapers in 3 days.

E

If we rename either the multiplier or the multiplicand, the product will be the same.

$$\begin{array}{r} 3 \times 4 = 12 \\ (3 \times 2) + (3 \times 2) = 12 \\ 6 \quad + \quad 6 \quad = 12 \end{array} \qquad \begin{array}{r} 3 \times 4 = 12 \\ (2 \times 4) + (1 \times 4) = 12 \\ 8 \quad + \quad 4 \quad = 12 \end{array} \qquad \begin{array}{r} 5 \times 3 = 15 \\ (5 \times 2) + (5 \times 1) = 15 \\ 10 \quad + \quad 5 \quad = 15 \end{array}$$

A Party
THE FOURS – MULTIPLYING 2-DIGIT NUMERALS

This page is for study only. Study the panels below as you look at the examples on page 37.

A

Four mothers baked cookies for the St. Valentine's Day party. If each mother baked 51 cookies, how many did they bake altogether?

$$\begin{array}{r} 51 \\ \times\ 4 \\ \hline \end{array}$$

B

HUNDREDS	TENS	ONES
	5	1
	×	4
2	0	4

ONES: $4 \times 1 = 4$ Write 4 in ONES place.
TENS: $4 \times 5 = 20$ 20 TENS = 2 HUNDREDS and 0 TENS.
Write 0 in TENS place and 2 in HUNDREDS place.
The mothers baked 204 cookies altogether.

C

Each of four children brought 40 candy hearts for the party. How many hearts did they bring altogether?

HUNDREDS	TENS	ONES
	4	0
	×	4
1	6	0

ONES: $4 \times 0 = 0$ Write 0 in ONES place.
TENS: $4 \times 4 = 16$
16 TENS = 1 HUNDRED and 6 TENS.
Write 6 in TENS place
and 1 in HUNDREDS place.

D

Study these examples

(a)	(b)	(c)	(d)
$7 \times 4 = 28$	$7 \times 4 = 28$	$7 \times 4 = 28$	$7 \times 4 = 28$
$(5+2) \times 4 = 28$	$7 \times (2+2) = 28$	$(4 \times 4) + (3 \times 4) = 28$	$(7 \times 2) + (7 \times 2) = 28$

E

$4 \times 7 = 28$

$4 \times 70 = 280$ (4×7 TENS)
$4 \times 700 = 2800$ (4×7 HUNDREDS)
$4 \times 7000 = 28000$ (4×7 THOUSANDS)

Look at the facts on the left. The top fact is called a **key fact**. The key fact helps you to find the answers to many other multiplication examples.

DIRECTIONS: **1** — Study the examples on this page. The red and black numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples **or** where the arrows point. For the examples below the windows, write your answers to the red examples where the red arrows point, and write your answers to the black examples where the black arrows point. **3** — To check your work, put your paper or Magic Slate under page 39. See if your answers are the same as the red and black numerals in the windows.

	31 × 4 5 × ▦ = 20 ▦ × 5 = 20	70 × 4 Eight 4's = ▦ Four 8's = ▦	42 × 4 4 × ▦ = 32 ▦ × 4 = 32
	41 × 4 3 × 4 = ▦ (3 × 1) + (3 × 3) = 12 ▦ + 9 = 12	92 × 4 6 × 4 = 24 (3 × ▦) + (3 × 4) = 24 12 + ▦ = 24	71 × 4 5 × 4 = 20 (5 × 2) + (5 × ▦) = 20 ▦ + 10 = 20
4 × 6	4 × 60 = ▦ 4 × 9 = ▦ 9 × 4 = ▦	4 × 600 = ▦ ▦ × 8 = 32 (4 × 5) + (4 × ▦) = 32	4 × 6000 = ▦ 4 × ▦ = 16 ▦ 4's in 16
	82 × 4 ▦ × 7 = 28 (2 × 7) + (2 × ▦) = 28	50 × 4 6 × 4 = ▦ (▦ × 4) + (1 × 4) = 24	72 × 4 ▦ × 4 = 36 (6 × 4) + (3 × ▦) = 36
	52 × 4 4 × 5 = ▦ (4 × ▦) + (4 × 3) = 20	80 × 4 8 × ▦ = 32 (▦ × 4) + (4 × 4) = 32	90 × 4 Seven 4's = ▦ Four 7's = ▦

DOLLARS AND CENTS
THE FOURS – MULTIPLYING 2-DIGIT NUMERALS; CARRYING

This page is for study only. Study the panels below as you look at the examples on page 39.

A

10 CENTS = 1 DIME

10 DIMES = 1 DOLLAR = 100 1¢s

$ is the **dollar sign**. **.** is the **decimal point**; it separates the dollars from the cents.

822
4;12

396
7;12

$6.20
3;6

B

Murray bought 4 pairs of socks for $.69 a pair. How much money did he spend?

$.69
×4

When multiplying numbers that represent money, be sure to put a dollar sign and decimal point in the product.

360
8;2

3600
4;5

36000
28;5

C

DOLLARS	DIMES	CENTS
	3	
$	.6	9
	×	4
		6

Step 1

Multiply the CENTS: 4 × 9 CENTS = 36 CENTS
36 CENTS = 3 DIMES and 6 CENTS.
Write 6 in CENTS place. Carry 3 DIMES.
Multiply the DIMES: 4 × 6 DIMES = 24 DIMES
Add the 3 DIMES you carried: 24 DIMES + 3 DIMES = 27 DIMES

992
5;20

$3.04
24;1

994
16;1

D

DOLLARS	DIMES	CENTS
	3	
$	.6	9
	×	4
$2	.7	6

Step 2

27 DIMES = 2 DOLLARS and 7 DIMES.
Put a decimal point (.) before the 7 DIMES.
Write 2 in DOLLARS place.
Put a dollar sign ($) before the 2 DOLLARS.

744
70;32

$9.72
9;270

344
20;700

E

$$\begin{array}{r} 60+5 \\ \times\ 4 \\ \hline 240+20 \end{array}$$

$$\begin{aligned} 4\times 65 &= 4\times(60+5) \\ &= (4\times 60)+(4\times 5) \\ &= 240 + 20 \\ &= 260 \end{aligned}$$

F

$$\begin{array}{r} 70+8 \\ \times\ 4 \\ \hline 280+32 \end{array}$$

$$\begin{aligned} 4\times 78 &= 4\times(70+8) \\ &= (4\times 70)+(4\times 8) \\ &= 280 + 32 \\ &= 312 \end{aligned}$$

4
28

6
36;3

4
4

DIRECTIONS: 1 — Study the examples on this page. The blue and black numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples **or** where the arrows point. For the examples below the windows, write your answers to the blue examples where the blue arrows point, and write your answers to the black examples where the black arrows point. **3** — To check your work, put your paper or Magic Slate under page 41. See if your answers are the same as the blue and black numerals in the windows.

$.96 × 4 = ☐
☐ × 4 = 36
4 × ☐ = 36
124
4

34 × 9 = ☐
☐ × 4 = 28
(7×2)+(7×☐)=28
280
32

44 × 8 = ☐
Four 6's = ☐
Six 4's = ☐
168
8

34 × 5 = ☐
8 × 4 = 32
(☐×4)+(2×4)=32
24 + ☐ =32
164
12;3

42 × 7 = ☐
4 × 6 = 24
(4×4)+(4×☐)=24
☐ + 8 =24
368
4;12

$.43 × 6 = ☐
7 × 4 = 28
(☐×4)+(2×4)=28
20 + ☐ =28
284
2;10

3 × 4 = ☐
4 × 95 = 380
(4×☐)+(4×5)=380
240
36

4 × ☐ = 32
4 × 62 = 248
(4×60)+(4×☐)=248
2400
4;3

☐ × 4 = 24
4 × 37 = 148
(☐×30)+(4×7)=148
24000
4

47 × 2 = ☐
4 × 4 = ☐
Four 4's in ☐
328
4;7

$.40 × 4 = ☐
1 × ☐ = 0
☐ × 1 = 0
200
24;5

74 × 3 = ☐
4 × ☐ = 12
☐ × 4 = 12
288
9;4

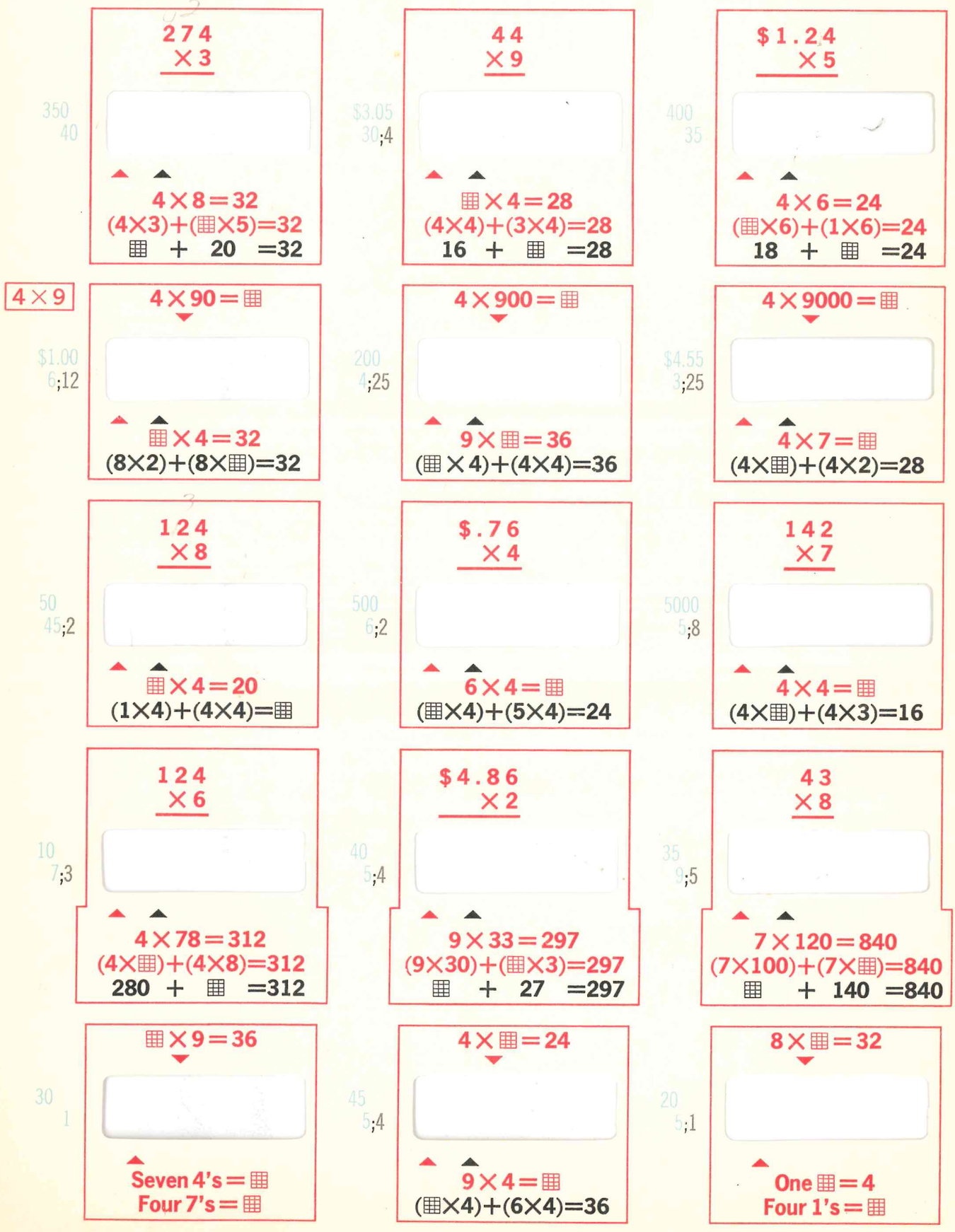
42 × 5 = ☐
Four 9's = ☐
Nine 4's = ☐
208
20;2

$.19 × 4 = ☐
1 × ☐ = 4
☐ × 1 = 4
320
4;4

34 × 8 = ☐
Four 2's = ☐
Two 4's = ☐
360
28

NOTE: Pay no attention to the red and black numerals outside the boxes.

DIRECTIONS: 1 — Study the examples on this page. The red and black numerals in the windows are the right answers. 2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples **or** where the arrows point. For the examples below the windows, write your answers to the red examples where the red arrows point, and write your answers to the black examples where the black arrows point. 3 — To check your work, put your paper or Magic Slate under page 38. See if your answers are the same as the red and black numerals in the windows.



NOTE: Pay no attention to the blue and black numerals outside the boxes.

DOLLARS AND CENTS
THE FOURS – MULTIPLYING 2- AND 3-DIGIT NUMERALS; CARRYING

This page is for study only. Study the panels below as you look at the examples on page 40.

A

Always Remember!

Multiply **before** you add the number you carried.
Put in the decimal point (.) before the dimes' digit in examples with money.
Put in the dollar sign ($) and decimal point in answers with money.
Multiply money the way you multiply ONES, TENS, and HUNDREDS.

$3.84 × 9 | 306 × 7;2 | 352 × 24

B

Alice's mother bought 4 pairs of shoes for Alice's little sisters, at $3.98 a pair. How much did she spend?

$3.98 × 4

170 × 6;8 | 294 × 2;16 | $2.58 × 5;8

C

DOLLARS	DIMES	CENTS
	3	
$ 3	.9	8
	×	4
		2

Step 1

CENTS: 4 × 8 CENTS = 32 CENTS ($.32)
Write 2 in CENTS place and carry 3 DIMES.
DIMES: 4 × 9 DIMES = 36 DIMES
36 DIMES = 3 DOLLARS and 6 DIMES.
Add the 3 DIMES you carried: 36 + 3 = 39

12 × 90 | 8 × 2 | 6 × 4

D

DOLLARS	DIMES	CENTS
3	3	
$ 3	.9	8
	×	4
$15	.9	2

Step 2

Write 9 in DIMES place.
Put in the decimal point (.). Carry 3 DOLLARS.
DOLLARS: 4 × 3 DOLLARS = 12 DOLLARS
Add the 3 DOLLARS you carried: 12 + 3 = 15
Write 15 in DOLLARS place. Put in the $.

94 × 16 | $1.60 × 0 | 222 × 3

E

4 × 3 = 12

4 × 30 = 120
4 × 300 = 1200
4 × 3000 = 12000

F

4 × 56 = 224

4 × (50 + 6) = 224
(4 × 50) + (4 × 6) = 224
200 + 24 = 224

210 × 36 | $.76 × 4 | 272 × 8

DIRECTIONS: 1 — Study the examples on this page. The blue and black numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples **or** where the arrows point. For the examples below the windows, write your answers to the blue examples where the blue arrows point, and write your answers to the black examples where the black arrows point. **3** — To check your work, put your paper or Magic Slate under page 40. See if your answers are the same as the blue and black numerals in the windows.

70 ×5 Eight 5's = ▦ Five 8's = ▦	$.61 ×5 6 × 5 = ▦ (▦×5)+(2×5)=30	80 ×5 5 × 7 = ▦ Seven 5's = ▦
$.20 ×5 5 × 6 = 30 (3×▦)+(2×6)=30 18 + ▦ =30	40 ×5 9 × 5 = 45 (5×5)+(▦×5)=45 ▦ + 20 =45	$.91 ×5 8 × 5 = 40 (▦×5)+(5×5)=40 15 + ▦ =40
5 × 1 5 × 10 = ▦ 5 × 9 = ▦ (5×▦)+(5×7)=45	5 × 100 = ▦ ▦ × 5 = 30 (▦×5)+(4×5)=30	5 × 1000 = ▦ ▦ × 8 = 40 (2×8)+(3×▦)=40
2 5 ×5 ×2 ▦ × 5 = 35 (7×2)+(7×▦)=35	8 5 ×5 ×8 ▦ × 9 = 45 (5×5)+(5×▦)=45	7 5 ×5 ×7 ▦ × 5 = 45 (4×5)+(▦×5)=45
6 5 ×5 ×6 ▦ × 5 = 5 5 × ▦ = 5	9 5 ×5 ×9 7 × ▦ = 35 (▦×5)+(3×5)=35	4 5 ×5 ×4 5 × ▦ = 25 (▦×5)+(4×5)=25

A Parade
THE FIVES – MULTIPLYING 2-DIGIT NUMERALS

This page is for study only. Study the panels below as you look at the examples on page 42.

A

$$\begin{array}{r} 21 \\ \times\ 5 \\ \hline \square \end{array}$$

Five lines of Boy Scouts marched in the parade, with 21 Scouts in each line. How many Boy Scouts marched in all?

ONES: $5 \times 1 = 5$ Write 5 in ONES place.
TENS: $5 \times 2 = 10$
10 TENS = 1 HUNDRED and no TENS.
Write 1 in HUNDREDS place
and zero in TENS place.

$$\begin{array}{r} 21 \\ \times\ 5 \\ \hline 105 \end{array}$$

B

C

$$\begin{array}{r} 11 \\ \times\ 5 \\ \hline \square \end{array}$$

11 people could ride on each float. How many people could ride on 5 floats?

D

ONES: $5 \times 1 = 5$
Write 5 in ONES place.
TENS: $5 \times 1 = 5$
Write 5 in TENS place.

$$\begin{array}{r} 11 \\ \times\ 5 \\ \hline 55 \end{array}$$

E

$5 \times 3 = 15$

$5 \times 30 = 150$
$5 \times 300 = 1500$
$5 \times 3000 = 15000$

F

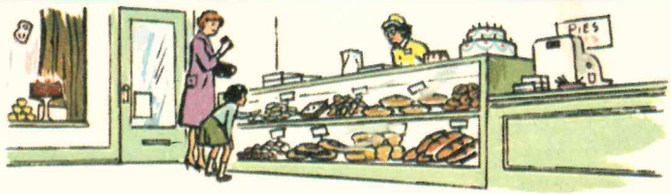
$5 \times 5 = 25$

$5 \times 50 = 250$
$5 \times 500 = 2500$
$5 \times 5000 = 25000$

THE FIVES – MULTIPLYING 2-DIGIT NUMERALS; CARRYING

A

Sugar cookies in the bakery cost $.85 a pound.
How much do 5 pounds of these cookies cost?



$.85
×5

B

DOLLARS	DIMES	CENTS
	2	
$	.8	5
	×	5
		5

CENTS: $5 \times 5 = 25$
25 CENTS = 2 DIMES and 5 CENTS.
Write 5 in CENTS place and carry 2 DIMES.

C

DOLLARS	DIMES	CENTS
	2	
$	.8	5
	×	5
		5

DIMES: $5 \times 8 = 40$
40 DIMES = 4 DOLLARS and 0 DIMES.
Add the 2 DIMES you are carrying: $40 + 2 = 42$
42 DIMES = 4 DOLLARS and 2 DIMES.

D

DOLLARS	DIMES	CENTS
	2	
$	.8	5
	×	5
$4	.2	5

Write 2 in DIMES place.
Put a . before the 2 DIMES.
Write 4 in DOLLARS place.
Put a $ before the 4 DOLLARS.
The product is $4.25.

E

$$\begin{aligned} 5 \times 320 &= 5 \times (300 + 20) \\ &= (5 \times 300) + (5 \times 20) \\ &= 1500 + 100 \\ &= 1600 \end{aligned}$$

F

$$\begin{aligned} 5 \times 1500 &= 5 \times (1000 + 500) \\ &= (5 \times 1000) + (5 \times 500) \\ &= 5000 + 2500 \\ &= 7500 \end{aligned}$$

$.45 ×6 5×72=360 (5×70)+(5×▦)=360 ▦ + 10 =360	85 ×3 5×203=1015 (5×200)+(5×▦)=1015 ▦ + 15 =1015	58 ×4 5×1800=9000 (5×1000)+(▦×800)=9000 ▦ + 4000 =9000
7×5=▦ Five 9's=▦ 9×5=▦	3×▦=15 5×7=▦ (5×▦)+(5×1)=35	6×5=▦ ▦×5=15 5×▦=15
56 ×5 ▦×9=45 (5×▦)+(5×5)=45	54 ×7 5×8=▦ (5×▦)+(5×4)=40	$.35 ×8 ▦×5=30 (6×1)+(6×▦)=30
87 ×5 ▦×1=5 (3×1)+(2×▦)=5	53 ×8 ▦×6=30 (5×4)+(5×▦)=30	$.52 ×9 5×9=▦ Nine 5's=▦
58 ×5 ▦×7=35 (5×3)+(5×▦)=35	$.53 ×2 8×5=▦ (8×▦)+(8×2)=40	97 ×5 2×▦=10 (▦×3)+(2×2)=10

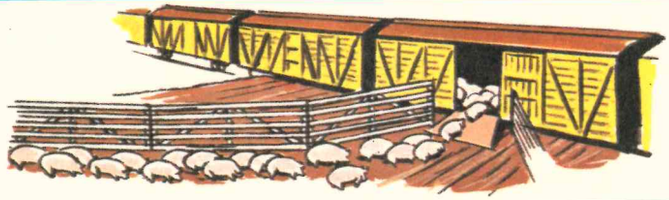
DIRECTIONS: 1 — Study the examples on this page. The red and black numerals in the windows are the right answers. 2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples **or** where the arrows point. For the examples below the windows, write your answers to the red examples where the red arrows point, and write your answers to the black examples where the black arrows point. 3 — To check your work, put your paper or Magic Slate under page 47. See if your answers are the same as the red and black numerals in the windows.

PRODUCTS IN THOUSANDS
THE FIVES – MULTIPLYING 2- AND 3-DIGIT NUMERALS; CARRYING

1 10 | 9 0 | 6 32

A

296 pigs were loaded on each of 5 freight cars. In all, how many pigs were on the train?



$$\begin{array}{r} 296 \\ \times\ 5 \\ \hline \end{array}$$

7 0 | 2 41 | 4 0

B

HUNDREDS	TENS	ONES
2	9	6
	×	5

$200 + 90 + 6$

$\times 5$

$1000 + 450 + 30 = 1480$

The product is one thousand, four hundred eighty.

2 24 | 1 31 | 1 0

C

THOUSANDS	HUNDREDS	TENS	ONES
	4	3	
	2	9	6
		×	5
		8	0

ONES: $5 \times 6 = 30$
Write 0 in ONES place. Carry 3 TENS.
TENS: $5 \times 9 = 45$
Add the 3 TENS you are carrying: $45 + 3 = 48$
Write 8 in TENS place. Carry 4 HUNDREDS.

10 0 | 9 0 | 3 12

D

THOUSANDS	HUNDREDS	TENS	ONES
	4	3	
	2	9	6
		×	5
1	4	8	0

HUNDREDS: $5 \times 2 = 10$
Add the 4 HUNDREDS you are carrying: $10 + 4 = 14$
14 HUNDREDS = 1 THOUSAND (1000) + 4 HUNDREDS (400).
Write 4 in HUNDREDS place and 1 in THOUSANDS place.
There were 1480 pigs on the train.

5 0 | 4 34 | 14 0

E

$$\begin{aligned} 5 \times 2500 &= 5 \times (2000 + 500) \\ &= (5 \times 2000) + (5 \times 500) \\ &= 10000 + 2500 \\ &= 12500 \end{aligned}$$

F

$$\begin{aligned} 5 \times 3200 &= 5 \times (3000 + 200) \\ &= (5 \times 3000) + (5 \times 200) \\ &= 15000 + 1000 \\ &= 16000 \end{aligned}$$

975 ×2 = $2.70 (2;350)
Five 6's = ▦
Six 5's = ▦

769 ×5 = 255 (3;1000)
8×5=▦
(6×5)+(▦×5)=40

785 ×4 = 232 (5;5000)
▦×5=25
(5×4)+(5×▦)=25

506 ×5 = 35 45
5×▦=35
(▦×7)+(2×7)=35

$1.05 ×9 = 5 (35;6)
6×▦=30
(4×5)+(2×▦)=30

354 ×6 = 30 3
5×▦=45
▦×5=45

$1.05 ×8 = 280 (5;4)
5×1500=7500
(▦×1000)+(5×500)=7500
5000 + ▦ =7500

$.54 ×7 = 378 (40;4)
5×65=325
(5×▦)+(5×5)=325
300 + ▦ =325

935 ×3 = $2.80 (6;4)
5×4300=21500
(▦×4000)+(5×300)=21500
20000 + ▦ =21500

▦×5=40
5×▦=30
(5×2)+(5×▦)=30
435 (5;1)

3×▦=15
One 5 = ▦
Five 1's = ▦
424 (5;2)

9×5=▦
▦×8=40
(5×1)+(5×▦)=40
$4.68 45

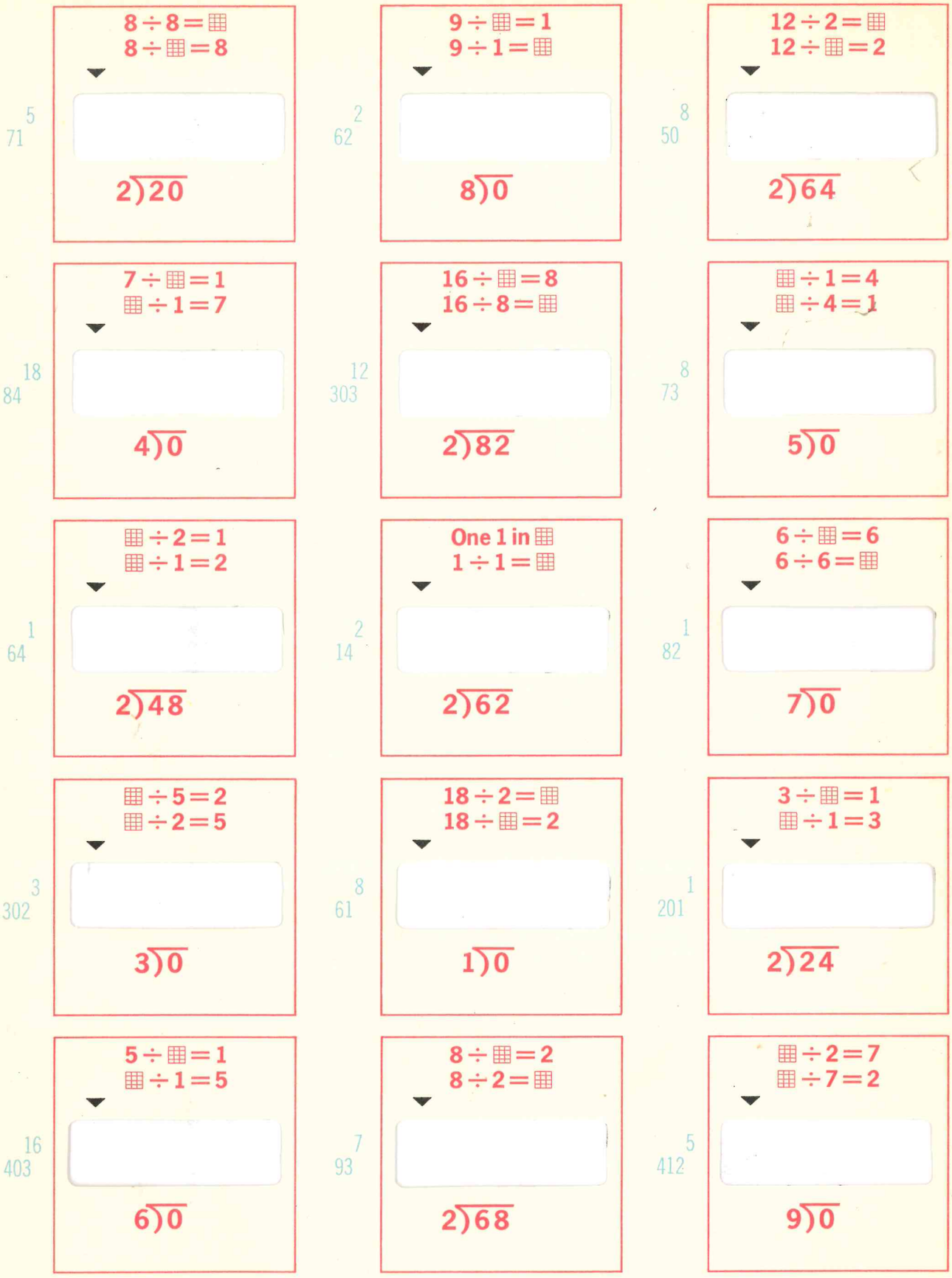
$.89 ×5 = 290 (5;4)
▦×5=10
(▦×5)+(1×5)=10

35 ×7 = $1.06 (40;3)
Five 9's = ▦
(5×▦)+(5×4)=45

768 ×5 = 485 (5;2)
0×0=▦
5×0=▦

DIRECTIONS: 1 — Study the examples on this page. The blue and black numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers through the windows straight under the examples **or** where the arrows point. For the examples below the windows, write your answers to the blue examples where the blue arrows point, and write your answers to the black examples where the black arrows point. **3** — To check your work, put your paper or Magic Slate under page 49. See if your answers are the same as the blue and black numerals in the windows.

NOTE: Pay no attention to the red and black numerals outside the boxes.



DIRECTIONS: 1 — Study the examples on this page. The red numerals in the windows are the right answers.

2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers where the arrows point. For the examples below the windows, write your answers through the windows straight over the examples.

3 — To check your work, put your paper or Magic Slate under page 46. See if your answers are the same as the red numerals in the windows.

NOTE: Pay no attention to the blue numerals outside the boxes.

ZEROS, ONES, AND TWOS IN DIVISION

1950
30

3845
40;2

3140
5;1

A

John said to five friends, "I put 6 apples in our hideout. There will be one for each of us." But rabbits had eaten all the apples. How many apples could each boy have?

$$6\overline{)0}\quad 0$$

Zero divided by 6 = zero $0 \div 6 = 0$

2530
7;3

$9.45
5;5

2124
9

B

$$9\overline{)9}\quad 1$$

Nine divided by 9 = 1 $9 \div 9 = 1$

If 9 children were to share 9 cupcakes equally, how many cupcakes would each child have?

$8.40
5;2500

$3.78
60;25

2805
5;1500

C

There were 8 gumdrops. How many boys could have one each?

$8 \div 1 = 8$

D

Jim and Boyd went to get some orangeade. The machine was empty. How much orangeade did each boy drink that day?

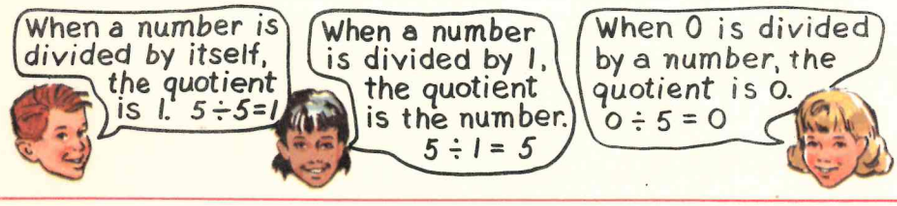
$$2\overline{)0}\quad 0$$

8
6;4

5
5

45
5;7

E


When a number is divided by itself, the quotient is 1. 5 ÷ 5 = 1
When a number is divided by 1, the quotient is the number. 5 ÷ 1 = 5
When 0 is divided by a number, the quotient is 0. 0 ÷ 5 = 0

2 Quotient
Divisor $9\overline{)18}$ Dividend

$4.45
2;1

245
45;5

3840
0;0

F

TENS	ONES
4	2

$2\overline{)8} \quad 4 = 2\overline{)80+4} \quad 40+2$

Divide the TENS: 8 TENS ÷ 2 = 4 TENS
Write 4 in TENS place.
Divide the ONES: 4 ONES ÷ 2 = 2 ONES
Write 2 in ONES place.
The quotient is 42.

This page is for study only. Study the panels above as you look at the examples on page 48.
DO NOT write through the windows on this page.

$10 \div 2 = \square$ $10 \div \square = 2$ $2\overline{)142}$	$14 \div \square = 7$ $14 \div 7 = \square$ $2\overline{)124}$	$\square \div 2 = 4$ $\square \div 4 = 2$ $2\overline{)100}$
$\square \div 2 = 9$ $\square \div 9 = 2$ $2\overline{)168}$	$\square \div 6 = 2$ $\square \div 2 = 6$ $2\overline{)606}$	$16 \div 2 = \square$ $16 \div \square = 2$ $2\overline{)146}$
$9 \div \square = 9$ $9 \div 9 = \square$ $2\overline{)128}$	$18 \div \square = 9$ $18 \div 9 = \square$ $2\overline{)28}$	$7 \div \square = 7$ $7 \div 7 = \square$ $2\overline{)164}$
$3 \div 1 = \square$ $\square \div 3 = 1$ $2\overline{)604}$	$\square \div 8 = 1$ $\square \div 1 = 8$ $2\overline{)122}$	$4 \div 4 = \square$ $4 \div \square = 4$ $2\overline{)402}$
$\square \div 2 = 8$ $\square \div 8 = 2$ $2\overline{)806}$	$14 \div \square = 2$ $14 \div 2 = \square$ $2\overline{)186}$	$\square \div 5 = 1$ $\square \div 1 = 5$ $2\overline{)824}$

DIRECTIONS: 1 — Study the examples on this page. The blue numerals in the windows are the right answers.

2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers where the arrows point. For the examples below the windows, write your answers through the windows straight over the examples.

3 — To check your work, put your paper or Magic Slate under page 48. See if your answers are the same as the blue numerals in the windows.

THE TWOS – DIVIDING 3-DIGIT NUMERALS (1)

A

There are 246 Brownies in the school. If they were to walk in twos, how many sets of two would there be?

$$2\overline{)246}$$

B

100 100 10 10 10 10 1 1 1 1 1 1

246 = 2 HUNDREDS, 4 TENS, and 6 ONES

C

HUNDREDS	TENS	ONES
2	4	6

$100 + 20 + 3 = 123$

$2\overline{)200 + 40 + 6}$

Panel D will show you a short way to work this example.

D

HUNDREDS	TENS	ONES
1	2	3

$2\overline{)246}$

Divide the HUNDREDS: 2 HUNDREDS ÷ 2 = 1 HUNDRED
Write 1 in HUNDREDS place.
Divide the TENS: 4 TENS ÷ 2 = 2 TENS Write 2 in TENS place.
Divide the ONES: 6 ONES ÷ 2 = 3 ONES Write 3 in ONES place.
There would be 123 sets of Brownies, with 2 in each set.

E

100 10 10 1 1 1 1 1 1

126 = 1 HUNDRED, 2 TENS, 6 ONES

F

10 10 10 10 10 10 10 10 10 10 10 1 1 1 1 1 1

126 also equals 12 TENS and 6 ONES

G

$$2\overline{)126}$$

There is only 1 HUNDRED. We cannot divide it into 2 equal groups of HUNDREDS. But we can change it to 10 TENS. 10 TENS + 2 TENS = 12 TENS
Now we can divide the TENS: $12 \div 2 = 6$ Write 6 in TENS place.
Divide the ONES: $6 \div 2 = 3$ Write 3 in ONES place.
The quotient is 63.

At the Airport
THE TWOS – DIVIDING 3-DIGIT NUMERALS (2)

This page is for study only. Study the panels below as you look at the examples on page 53.

A

488 people arrived in four different planes. Each airplane carried the same number of passengers. How many people were on each plane?

$4\overline{)488}$

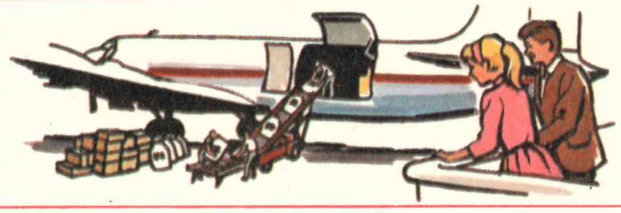
B

$$\begin{array}{r} 122 \\ 4\overline{)488} \end{array}$$

Divide the HUNDREDS: 4 HUNDREDS ÷ 4 = 1 HUNDRED
Write 1 in HUNDREDS place.
Divide the TENS: 8 TENS ÷ 4 = 2 TENS Write 2 in TENS place.
Divide the ONES: 8 ONES ÷ 4 = 2 ONES Write 2 in ONES place.
There were 122 people on each plane.

C

Peter and Kay saw 140 mailbags being loaded on 7 airplanes. If the same number of bags went on each plane, how many bags did each plane carry?



$7\overline{)140}$

D

$$\begin{array}{r} 20 \\ 7\overline{)140} \end{array}$$

We cannot divide the 1 HUNDRED into 7 equal groups of HUNDREDS.
We must change it to 10 TENS. 10 TENS + 4 TENS = 14 TENS
Now we can divide the TENS: $14 \div 7 = 2$ Write 2 in TENS place.
There are 0 ONES. $0 \div 7 = 0$ Write 0 in ONES place.
Each plane carried 20 mailbags.

E

You can rename the dividend without changing the quotient:

(a)
$12 \div 2 = 6$
$(6+6) \div 2 = 6$
$(6 \div 2) + (6 \div 2) = 6$
$3 + 3 = 6$

(b)
$12 \div 2 = 6$
$(10+2) \div 2 = 6$
$(10 \div 2) + (2 \div 2) = 6$
$5 + 1 = 6$

(c)
$12 \div 2 = 6$
$(4+8) \div 2 = 6$
$(4 \div 2) + (8 \div 2) = 6$
$2 + 4 = 6$

DIRECTIONS: 1 — Study the examples on this page. The red and black numerals in the windows are the right answers. 2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers to the red examples where the red arrows point, and write your answers to the black examples where the black arrows point. For the examples below the windows, write your answers through the windows straight over the examples.
3 — To check your work, put your paper or Magic Slate under page 55. See if your answers are the same as the red and black numerals in the windows.

▦ ÷ 2 = 6 ▦ ÷ 6 = 2 3)603	2 ÷ 2 = ▦ 2 ÷ ▦ = 2 6)120	▦ ÷ 2 = 9 ▦ ÷ 9 = 2 9)909
14 ÷ ▦ = 2 14 ÷ 2 = ▦ 5)100	▦ 2's in 4 4 ÷ ▦ = 2 4)808	▦ ÷ 2 = 6 (6 + 6) ÷ 2 = ▦ 8)80
16 ÷ 8 = ▦ (▦ + 8) ÷ 8 = 2 7)770	10 ÷ 2 = ▦ (▦ + 2) ÷ 2 = 5 8)168	18 ÷ 9 = ▦ (9 + 9) ÷ ▦ = 2 9)180
18 ÷ 2 = ▦ (10 ÷ 2) + (8 ÷ 2) = 9 ▦ + 4 = 9 5)105	10 ÷ 5 = ▦ (5 ÷ ▦) + (5 ÷ 5) = 2 2)64	12 ÷ 6 = 2 (6 ÷ ▦) + (6 ÷ 6) = 2 1 + ▦ = 2 7)147
14 ÷ 7 = 2 (▦ + 7) ÷ 7 = 2 (7 ÷ 7) + (7 ÷ ▦) = 2 4)848	14 ÷ 2 = 7 (▦ ÷ 2) + (6 ÷ 2) = 7 4 + ▦ = 7 9)189	16 ÷ 2 = 8 (14 ÷ 2) + (2 ÷ ▦) = 8 ▦ + 1 = 8 3)336

THE THREES – DIVIDING 3-DIGIT NUMERALS (1)

This page is for study only. Study the panels below as you look at the examples on page 55.

A

You can rename the dividend without changing the quotient:

(a)
$12 \div 3 = 4$
$(9+3) \div 3 = 4$
$(9 \div 3) + (3 \div 3) = 4$
$3 + 1 = 4$

(b)
$16 \div 2 = 8$
$(12+4) \div 2 = 8$
$(12 \div 2) + (4 \div 2) = 8$
$6 + 2 = 8$

(c)
$18 \div 9 = 2$
$(9+9) \div 9 = 2$
$(9 \div 9) + (9 \div 9) = 2$
$1 + 1 = 2$

9;6
30

12
300

8
3000

B

Farmer Brown set out 69 tomato plants in 3 equal rows. How many plants were in each row?

$3\overline{)69}$ → 23

Divide the TENS: $6 \div 3 = 2$
Write 2 in TENS place.
Divide the ONES: $9 \div 3 = 3$
Write 3 in ONES place.
The quotient is 23.

14;1
31

6
30

9;2
32

C

Farmer Brown told the children he had 219 apple trees planted in 3 equal rows. He asked them how many trees were in each row.

$3\overline{)219}$

27
20

3;12
200

3
2000

D

100 100 10 | | | | | |

219 = 2 HUNDREDS, 1 TEN, 9 ONES

E

10 10 10 10 10 10 10 | | |
10 10 10 10 10 10 10 | | |
10 10 10 10 10 10 10 | | |

219 also equals 21 TENS and 9 ONES

21;1
30

16;1
110

24;7
31

F

$3\overline{)219}$ → 73

Change the 2 HUNDREDS to 20 TENS. 20 TENS + 1 TEN = 21 TENS
Divide the TENS: $21 \div 3 = 7$ Write 7 in TENS place.
Divide the ONES: $9 \div 3 = 3$ Write 3 in ONES place.
There were 73 apple trees in each row.

18
101

7
73

4
30

DIRECTIONS: **1** — Study the examples on this page. The blue and black numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers to the blue examples where the blue arrows point, and write your answers to the black examples where the black arrows point. For the examples below the windows, write your answers through the windows straight over the examples. **3** — To check your work, put your paper or Magic Slate under page 57. See if your answers are the same as the blue and black numerals in the windows.

$27 \div \square = 9$
$27 \div 9 = \square$

$3\overline{)39}$

12
201

$24 \div 3 = \square$
$24 \div \square = 3$

$3\overline{)186}$

1
20

$18 \div \square = 6$
$18 \div 6 = \square$

$3\overline{)276}$

18
101

$12 \div \square = 4$
$12 \div 4 = \square$

$3\overline{)249}$

7
20

$15 \div \square = 3$
$(\square \div 5) + (5 \div 5) = 3$

$3\overline{)123}$

2
202

$21 \div \square = 3$
$(\square \div 7) + (7 \div 7) = 3$

$3\overline{)213}$

12;6
10

$\square \div 5 = 3$
$\square \div 3 = 5$

$3\overline{)270}$

2;8
110

$\square \div 6 = 3$
$(12 \div 6) + (6 \div \square) = 3$

$3\overline{)159}$

5;8
21

$3 \div 1 = \square$
$\square$ 1's in 3

$3\overline{)93}$

2;9
20

$\square \div 3 = 2$
$(3 \div 3) + (3 \div 3) = \square$

$3\overline{)180}$

9;5
21

$27 \div 3 = \square$
$(18 \div \square) + (9 \div 3) = 9$

$3\overline{)216}$

2;5
32

$12 \div \square = 3$
$(\square \div 4) + (4 \div 4) = 3$

$3\overline{)243}$

6;1
21

$24 \div 8 = 3$
$(16 \div 8) + (8 \div \square) = 3$
$\square + 1 = 3$

$3\overline{)96}$

7;7
212

$21 \div 7 = \square$
$21 \div \square = 7$

$3\overline{)156}$

8;3
21

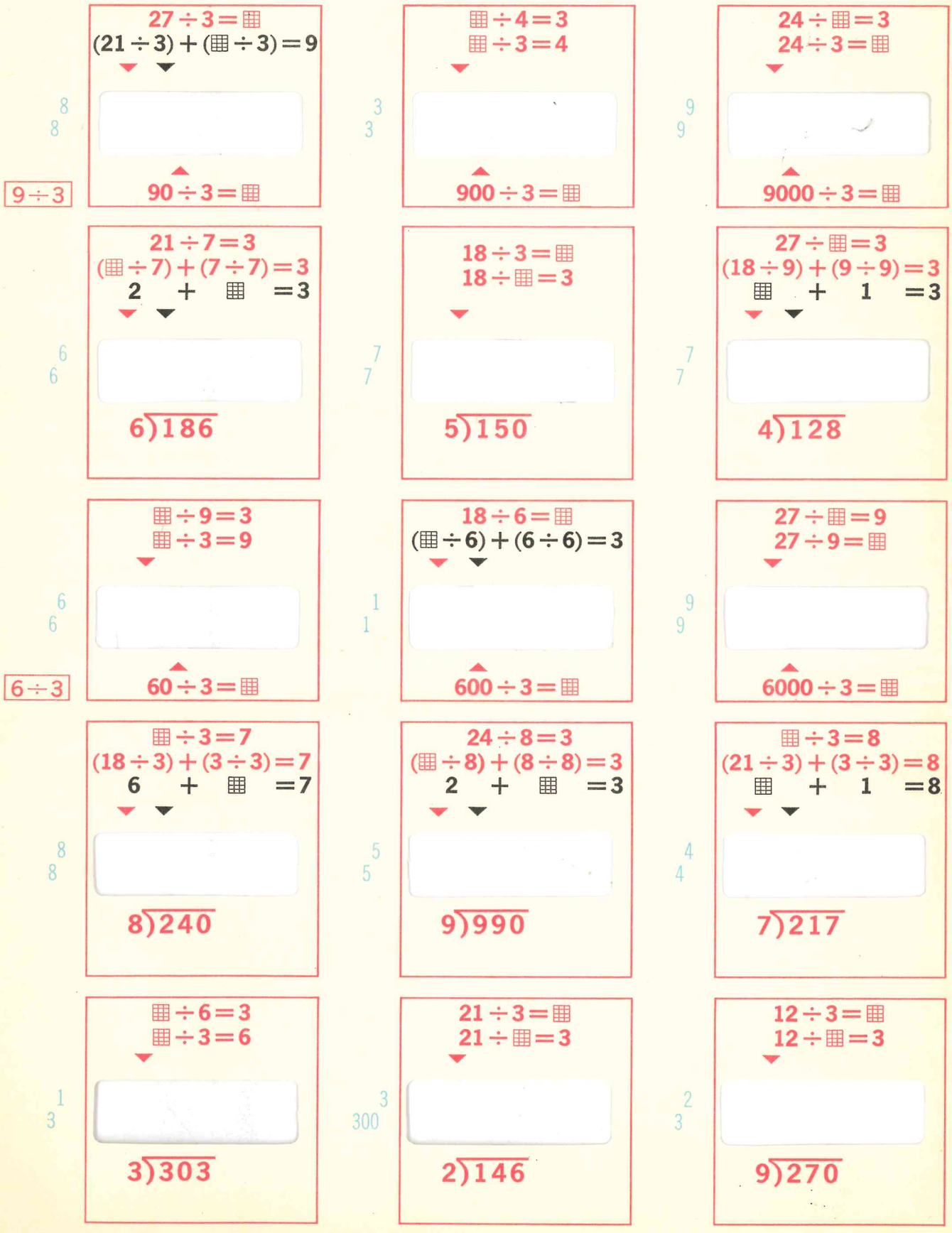
$15 \div 3 = 5$
$(\square \div 3) + (6 \div 3) = 5$
$3 + \square = 5$

$3\overline{)210}$

2;7
112

NOTE: Pay no attention to the red and black numerals outside the boxes.

DIRECTIONS: 1 — Study the examples on this page. The red and black numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers to the red examples where the red arrows point, and write your answers to the black examples where the black arrows point. For the examples below the windows, write your answers through the windows straight over the examples **or** where the arrows point. **3** — To check your work, put your paper or Magic Slate under page 54. See if your answers are the same as the red and black numerals in the windows.



NOTE: Pay no attention to the blue numerals outside the boxes.

THE THREES – DIVIDING 3-DIGIT NUMERALS (2)

This page is for study only. Study the panels below as you look at the examples on page 56.

A

Mary Jane's family traveled 396 miles in 3 days. If they traveled the same number of miles each day, how many miles did they travel in one day?

$3\overline{)396}$

3 13 8 62 3 92

B

396 = 100 100 100 10 10 10 10 10 10 10 10 10 10 1 1 1 1 1 1

396 = 3 HUNDREDS + 9 TENS + 6 ONES

396 = 300 + 90 + 6

3 83 5;10 41 7;14 71

C

$$3\overline{)396}\quad 132$$

Divide the HUNDREDS: $3 \div 3 = 1$ Write 1 in HUNDREDS place.
Divide the TENS: $9 \div 3 = 3$ Write 3 in TENS place.
Divide the ONES: $6 \div 3 = 2$ Write 2 in ONES place.
Mary Jane's family traveled 132 miles each day.

15 90 18;6 53 3 31

D

When you rename the dividend by changing it to other numerals, be sure the other numerals can be divided evenly by the divisor:

$18 \div 3 = 6$ $(15 + 3) \div 3 = 6$ $(12 + 6) \div 3 = 6$ $(9 + 9) \div 3 = 6$

These are good ways to rename the dividend, because the 2 numerals in parentheses equal 18 and **each of these numerals can be divided evenly by 3.**

6;2 60 9;3 72 4;8 81

E

Dividing TENS, HUNDREDS, and THOUSANDS is like dividing ONES:

2 ONES ÷ 2 = 1 ONE
2 ÷ 2 = 1
2 TENS ÷ 2 = 1 TEN
20 ÷ 2 = 10

2 HUNDREDS ÷ 2 = 1 HUNDRED
200 ÷ 2 = 100
2 THOUSANDS ÷ 2 = 1 THOUSAND
2000 ÷ 2 = 1000

6 ÷ 2 = 3
60 ÷ 2 = 30
600 ÷ 2 = 300
6000 ÷ 2 = 3000

8;2 32 3 52 9;2 70

DIRECTIONS: **1** — Study the examples on this page. The blue numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers where the arrows point. For the examples below the windows, write your answers through the windows straight over the examples **or** where the arrows point.

3 — To check your work, put your paper or Magic Slate under page 56. See if your answers are the same as the blue numerals in the windows.

16 ÷ 2 = ▦ 1/2 of 16 = ▦ 2)16	9 ÷ 3 = ▦ 1/3 of 9 = ▦ 3)9	27 ÷ 3 = ▦ 1/3 of 27 = ▦ 3)27
18 ÷ 3 = ▦ 1/3 of 18 = ▦ 3)18	14 ÷ 2 = ▦ 1/2 of 14 = ▦ 2)14	21 ÷ 3 = ▦ 1/3 of 21 = ▦ 3)21
12 ÷ 2 = ▦ 1/2 of 12 = ▦ 2)12	3 ÷ 3 = ▦ 1/3 of 3 = ▦ 3)3	18 ÷ 2 = ▦ 1/2 of 18 = ▦ 2)18
24 ÷ 3 = ▦ 1/3 of 24 = ▦ 3)24	10 ÷ 2 = ▦ 1/2 of 10 = ▦ 2)10	8 ÷ 2 = ▦ 1/2 of 8 = ▦ 12 ÷ 3 = ▦ 1/3 of 12 = ▦
2 ÷ 2 = ▦ 1/2 of 2 = ▦ 33 ÷ 3 = 11 (30 ÷ ▦) + (3 ÷ 3) = 11	6 ÷ 2 = ▦ 1/2 of 6 = ▦ 309 ÷ 3 = 103 (▦ ÷ 3) + (9 ÷ 3) = 103	6 ÷ 3 = ▦ 1/3 of 6 = ▦ 603 ÷ 3 = 201 (600 ÷ 3) + (▦ ÷ 3) = 201

At the Zoo
THE TWOS AND THREES – DIVISION WITH FRACTIONAL FORM

This page is for study only. Study the panels below as you look at the examples on page 58.

A

Equal parts mean parts that are the same size. When we divide a number into 2 equal parts, we call each part **one half**. One half can be written **1/2**. Parts of a whole are called **fractions**.

1/2 of 10 means 10 divided by 2.

$10 \div 2 = 5$ $\quad 2\overline{)10}$ (5)

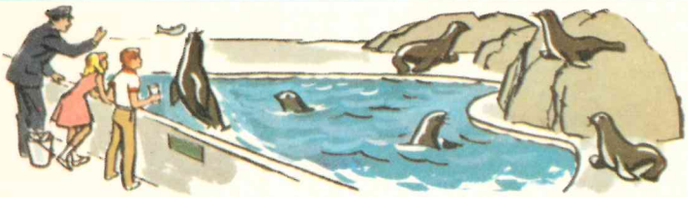
B

When we divide a number into 3 equal parts, we call each part **one third**. One third is also a fraction. It may be written **1/3**.

1/3 of 9 means 9 divided by 3.

$9 \div 3 = 3$ $\quad 3\overline{)9}$ (3)

C



1/2 of the 6 seals were swimming.
How many seals were swimming?

$2\overline{)6}$ (3) $\quad$ 1/2 of 6 = 3

D

1/3 of the 12 polar bears got their coats muddy.
How many bears were muddy?

1/3 of 12 = 4 $\quad 3\overline{)12}$ (4)

E

$$63 \div 3 = 3\overline{)63} = 3\overline{)60+3}$$
$$= (60+3) \div 3$$
$$= (60 \div 3) + (3 \div 3)$$
$$= 20 + 1$$
$$= 21$$

F

$$906 \div 3 = 3\overline{)906} = 3\overline{)900+6}$$
$$= (900+6) \div 3$$
$$= (900 \div 3) + (6 \div 3)$$
$$= 300 + 2$$
$$= 302$$

DOLLARS AND CENTS
THE FOURS – DIVIDING 3-DIGIT NUMERALS (1)

A

Jack paid $1.60 for 4 children's tickets. How much did 1 ticket cost?

$$4\overline{)\$1.60}$$

B

Change $1.00 to 10 DIMES.
Add 10 DIMES to 6 DIMES.
Divide 16 DIMES by 4. Write 4 in DIMES place.
Put in the dollar sign ($) and the decimal point (.).
Divide 0 CENTS by 4. Write 0 in CENTS place.

$$4\overline{)\$1.60}$$

C

If Jack paid $1.60 for 4 tickets, each ticket cost $.40. You can check this by multiplying $.40 by 4:

$$\begin{array}{r} \$\ .40 \\ \times\ 4 \\ \hline \$1.60 \end{array}$$

D

When we divide a number into 4 equal parts, we call each fraction **one quarter**. One quarter may be written 1/4.

1/4 of $1.60 = $.40

E

1/4 of the 16 children in Jack's row were girls. How many girls were sitting in his row?

1/4 of 16 = 4

$$4\overline{)16}$$

16 ÷ 4 = 4

F

4 ÷ 4 = 1	4 × 1 = 4
40 ÷ 4 = 10	4 × 10 = 40
400 ÷ 4 = 100	4 × 100 = 400
4000 ÷ 4 = 1000	4 × 1000 = 4000

G

28 ÷ 4 = 7	4 × 7 = 28
280 ÷ 4 = 70	4 × 70 = 280
2800 ÷ 4 = 700	4 × 700 = 2800
28000 ÷ 4 = 7000	4 × 7000 = 28000

$4 \div 1 = 4$ $(2 \div 1) + (2 \div \square) = 4$ $\square + 2 = 4$ $4\overline{)\$3.24}$	$36 \div 9 = \square$ $(\square \div 9) + (9 \div 9) = 4$ $4\overline{)244}$	$12 \div \square = 4$ 1/4 of $12 = \square$ $4\overline{)288}$
$28 \div \square = 4$ $(\square + 7) \div 7 = 4$ $4\overline{)\$2.40}$	$20 \div \square = 4$ 1/4 of $20 = \square$ $4\overline{)200}$	$\square \div 4 = 6$ $\square \div 6 = 4$ $4\overline{)\$1.64}$
$8 \div 2 = \square$ $8 \div \square = 2$ $80 \div 4 = \square$ $8 \div 4$	$40 \div \square = 5$ 1/5 of $40 = \square$ $800 \div 4 = \square$	$\square \div 9 = 4$ 1/4 of $\square = 9$ $8000 \div 4 = \square$
$28 \div \square = 7$ $28 \div 7 = \square$ $4\overline{)\$2.04}$	$12 \div 3 = \square$ $(\square \div 3) + (6 \div 3) = 4$ $4\overline{)120}$	$\square \div 8 = 4$ $\square \div 4 = 8$ $4\overline{)\$2.80}$
$36 \div \square = 4$ $(\square \div 9) + (18 \div 9) = 4$ $360 \div 4 = \square$ $36 \div 4$	$24 \div \square = 4$ 1/4 of $24 = \square$ $3600 \div 4 = \square$	$24 \div 6 = \square$ $(12 \div \square) + (12 \div 6) = 4$ $36000 \div 4 = \square$

DIRECTIONS: 1 — Study the examples on this page. The red and black numerals in the windows are the right answers. 2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers to the red examples where the red arrows point, and write your answers to the black examples where the black arrows point. For the examples below the windows, write your answers through the windows straight over the examples **or** where the arrows point. 3 — To check your work, put your paper or Magic Slate under page 63. See if your answers are the same as the red and black numerals in the windows.

DOLLARS AND CENTS
THE FOURS – DIVIDING 3-DIGIT NUMERALS (2)

5
80

1
800

8;32
8000

101;5
2

90;400
35

31;150
20

A

Two hundred forty-eight Indians came to the Algonquin village for a powwow. If the same number came from each of eight different tribes, how many Indians were there from each tribe?

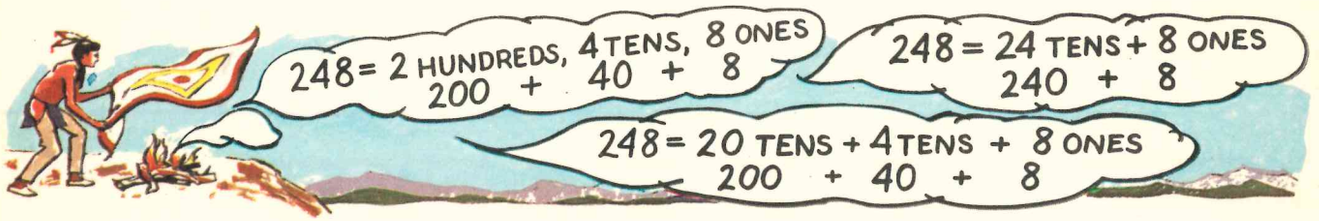
$$8\overline{)248}$$

3;10
$.60

30;6
50

5;36
71

B



9
21

6;20
$.30

25
61

C

$$8\overline{)248}\quad \begin{matrix}31\end{matrix}$$

TENS: $24 \div 8 = 3$
Write 3 in TENS place.
ONES: $8 \div 8 = 1$
Write 1 in ONES place.
31 Indians came from each tribe.

40;3
40

7;2
70

5;4
$.91

D

$$328 \div 4 = (320 + 8) \div 4$$
$$= (320 \div 4) + (8 \div 4)$$
$$= 80 + 2 = 82$$

E

$$440 \div 4 = (400 + 40) \div 4$$
$$= (400 \div 4) + (40 \div 4)$$
$$= 100 + 10 = 110$$

This page is for study only. Study the panels above as you look at the examples on page 63.

 DO NOT write through the windows on this page.

$16 \div \square = 4$
$\square$ 4's in 16

1;2
$.81

$208 \div 4 = 52$
$(200 \div 4) + (8 \div \square) = 52$

$32 \div 4 = \square$
$(\square \div 4) + (12 \div 4) = 8$

4;27
61

$480 \div 4 = 120$
$(\square \div 4) + (80 \div 4) = 120$

$24 \div 6 = \square$
$24 \div \square = 6$

3
72

$160 \div 4 = 40$
$(\square \div 4) + (60 \div 4) = 40$

$369 \div 9 = \square$
$(\square \div 9) + (9 \div 9) = 41$

7;21
$.60

$28 \div \square = 4$
$28 \div 4 = \square$

$328 \div 8 = \square$
$(\square \div 8) + (8 \div 8) = 41$

5
50

$4 \div \square = 4$
$\square$ 4's in 4

$168 \div 4 = \square$
$(160 \div \square) + (8 \div 4) = 42$

24
$.41

$32 \div \square = 4$
1/4 of $32 = \square$

1/4 of $36 = \square$
$36 \div 4 = \square$

4
20

$9\overline{)\$3.60}$

$\square \div 7 = 4$
1/4 of $\square = 7$

8
200

$6\overline{)246}$

$32 \div 8 = \square$
$(24 \div \square) + (8 \div 8) = 4$

36
2000

$2\overline{)188}$

$24 \div 4 = 6$
$(20 \div \square) + (4 \div 4) = 6$
$5 + \square = 6$

4
$.51

$5\overline{)200}$

1/4 of $16 = \square$
$16 \div 4 = \square$

4;6
30

$7\overline{)287}$

$24 \div 6 = 4$
$(18 \div \square) + (6 \div 6) = 4$
$3 + 1 = \square$

32
$.70

$4\overline{)\$3.20}$

$20 \div 5 = 4$
$(15 \div 5) + (5 \div \square) = 4$
$\square + 1 = 4$

9;18
90

$8\overline{)320}$

$\square \div 7 = 4$
$\square \div 4 = 7$

6
900

$3\overline{)129}$

$\square \div 4 = 8$
$(28 \div 4) + (4 \div 4) = 8$
$\square + 1 = 8$

4;6
9000

$4\overline{)\$2.84}$

DIRECTIONS: 1 — Study the examples on this page. The blue and black numerals in the windows are the right answers. 2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers to the blue examples where the blue arrows point, and write your answers to the black examples where the black arrows point. For the examples below the windows, write your answers through the windows straight over the examples **or** where the arrows point. 3 — To check your work, put your paper or Magic Slate under page 65. See if your answers are the same as the blue and black numerals in the windows.

NOTE: Pay no attention to the red and black numerals outside the boxes.

25 ÷ 5 = ▦
1/5 of 25 = ▦
25
300
400 ÷ 5 = ▦
40 ÷ 5

5 ÷ ▦ = 5
1/5 of 5 = ▦
35
20
4000 ÷ 5 = ▦

40 ÷ ▦ = 5
(▦ ÷ 8) + (8 ÷ 8) = 5
9
45
40000 ÷ 5 = ▦

505 ÷ 5 = ▦
(500 ÷ ▦) + (5 ÷ 5) = 101
5;8
8
10 ÷ ▦ = 5
1/5 of 10 = ▦

450 ÷ 5 = ▦
(▦ ÷ 5) + (50 ÷ 5) = 90
7
450
▦ ÷ 7 = 5
1/5 of ▦ = 7

155 ÷ 5 = ▦
(▦ ÷ 5) + (5 ÷ 5) = 31
8
7
1/5 of ▦ = 4
▦ ÷ 4 = 5

15 ÷ 5 = ▦
(▦ ÷ 5) + (5 ÷ 5) = 3
45
53
5)$3.00

▦ ÷ 6 = 5
(18 ÷ 6) + (12 ÷ ▦) = 5
5
50
5)250

45 ÷ 9 = ▦
(▦ ÷ 9) + (9 ÷ 9) = 5
30
51
5)355

45 ÷ ▦ = 5
1/5 of 45 = ▦
7;3
50
5)105

30 ÷ 5 = ▦
(▦ ÷ 5) + (10 ÷ 5) = 6
5;27
51
5)$1.50

Five 5's in ▦
▦ ÷ 5 = 5
40;16
50
5)305

▦ ÷ 8 = 5
(24 ÷ 8) + (16 ÷ 8) = 5
▦ + 2 = 5
6;4
50
5)200

35 ÷ ▦ = 5
(21 ÷ 7) + (14 ÷ 7) = 5
3 + ▦ = 5
8;6
52
5)350

30 ÷ 6 = ▦
(24 ÷ 6) + (6 ÷ 6) = 5
▦ + 1 = 5
9;1
70
5)$4.55

DIRECTIONS: 1 — Study the examples on this page. The red and black numerals in the windows are the right answers. 2 — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers to the red examples where the red arrows point, and write your answers to the black examples where the black arrows point. For the examples below the windows, write your answers through the windows straight over the examples **or** where the arrows point. 3 — To check your work, put your paper or Magic Slate under page 62. See if your answers are the same as the red and black numerals in the windows.

NOTE: Pay no attention to the blue and black numerals outside the boxes.

DOLLARS AND CENTS
THE FIVES – DIVIDING 3-DIGIT NUMERALS (1)

4 4 | 8;20 400 | 4 100

A

Owen paid $4.55 for a 5-pound ham.
How much did 1 pound cost?

Quotient
Divisor $5\overline{)\$4.55}$ Dividend

41;360 7 | 41;320 1 | 42;4 8

B

$$5\overline{)\$4.55} \quad \$.91$$

Change 4 DOLLARS to 40 DIMES. Add 5 DIMES.
Divide 45 DIMES by 5. Write 9 in DIMES place.
Put the $ and the . before the 9 DIMES.
Divide 5 CENTS by 5. Write 1 in CENTS place.
The quotient is $.91.

9 $.40 | 28 41 | 4;8 94

C

$$5\overline{)505} \quad 101$$

HUNDREDS: $5 \div 5 = 1$ Write 1 in HUNDREDS place.
TENS: $0 \div 5 = 0$ Write 0 in TENS place.
ONES: $5 \div 5 = 1$ Write 1 in ONES place.
The quotient is 101.

4;1 40 | 4 41 | 6;4 $.80

D

One morning 1/5 of 30 boxes of cookies were sold.
How many boxes were sold?

$1/5 \text{ of } 30 = 6 \qquad 30 \div 5 = 6$

E

$35 \div 5 = 7$ $\quad 5 \times 7 = 35$
$350 \div 5 = 70$ $\quad 5 \times 70 = 350$
$3500 \div 5 = 700$ $\quad 5 \times 700 = 3500$
$35000 \div 5 = 7000$ $\quad 5 \times 7000 = 35000$

5;3 40 | 28 43 | 32;7 $.71

F

$$205 \div 5 = 5\overline{)205} = 5\overline{)200 + 5}$$
$$= (200 + 5) \div 5$$
$$= (200 \div 5) + (5 \div 5)$$
$$= 40 + 1$$
$$= 41$$

G

$$550 \div 5 = 5\overline{)550} = 5\overline{)500 + 50}$$
$$= (500 + 50) \div 5$$
$$= (500 \div 5) + (50 \div 5)$$
$$= 100 + 10$$
$$= 110$$

This page is for study only. Study the panels above as you look at the examples on page 64.
DO NOT write through the windows on this page.

1/5 of ▦ = 5 ▦ ÷ 5 = 5 305 ÷ 5 = 61 (▦ ÷ 5) + (5 ÷ 5) = 61	▦ ÷ 7 = 5 ▦ ÷ 5 = 7 420 ÷ 5 = 84 (400 ÷ 5) + (▦ ÷ 5) = 84	▦ 5's in 45 45 ÷ 5 = ▦ 1045 ÷ 5 = 209 (1000 ÷ 5) + (▦ ÷ 5) = 209
40 ÷ 8 = ▦ (32 ÷ ▦) + (8 ÷ 8) = 5 208 ÷ 4 = 52 (200 ÷ 4) + (▦ ÷ 4) = 52	35 ÷ 5 = ▦ 1/5 of 35 = ▦ 455 ÷ 5 = 91 (▦ ÷ 5) + (5 ÷ 5) = 91	40 ÷ ▦ = 5 1/5 of 40 = ▦ 357 ÷ 7 = 51 (350 ÷ 7) + (▦ ÷ 7) = 51
1/5 of ▦ = 9 ▦ ÷ 5 = 9 3)159	▦ 5's in 25 25 ÷ 5 = ▦ 8)400	1/5 of ▦ = 6 ▦ ÷ 6 = 5 6)306
35 ÷ ▦ = 5 (14 ÷ 7) + (21 ÷ 7) = 5 2 + ▦ = 5 9)450	45 ÷ 9 = ▦ (▦ ÷ 9) + (18 ÷ 9) = 5 4)204	▦ ÷ 8 = 5 (24 ÷ 8) + (▦ ÷ 8) = 5 3 + 2 = 5 7)350
30 ÷ 6 = 5 (24 ÷ 6) + (▦ ÷ 6) = 5 ▦ + 1 = 5 6)300	40 ÷ 5 = ▦ (30 ÷ 5) + (10 ÷ 5) = 8 ▦ + 2 = 8 2)104	45 ÷ ▦ = 5 (36 ÷ 9) + (9 ÷ 9) = 5 4 + ▦ = 5 5)350

DIRECTIONS: **1** — Study the examples on this page. The blue and black numerals in the windows are the right answers. **2** — Put a piece of paper or a Magic Slate under this page. For the examples above the windows, write your answers to the blue examples where the blue arrows point, and write your answers to the black examples where the black arrows point. For the examples below the windows, write your answers through the windows straight over the examples **or** where the arrows point. **3** — To check your work, put your paper or Magic Slate under page 64. See if your answers are the same as the blue and black numerals in the windows.

DOLLARS AND CENTS
THE FIVES – DIVIDING 3-DIGIT NUMERALS (2)

A

Four children tied for first place in the relay races.
Their total score was 208.
How many points did each child earn?

$$4\overline{)208}\quad 52$$

Change 2 HUNDREDS to 20 TENS.
Divide the TENS: $20 \div 4 = 5$
Write 5 in TENS place.
ONES: $8 \div 4 = 2$ Write 2 in ONES place.
Each child earned 52 points.

B

$$\begin{aligned} 405 \div 5 &= (400 + 5) \div 5 \\ &= (400 \div 5) + (5 \div 5) \\ &= 80 + 1 \\ &= 81 \end{aligned}$$

C

$$\begin{aligned} 1025 \div 5 &= (1000 + 25) \div 5 \\ &= (1000 \div 5) + (25 \div 5) \\ &= 200 + 5 \\ &= 205 \end{aligned}$$

D

Nine teachers each spent the same amount for prizes.
If the prizes cost $4.59 altogether, how much did each teacher spend?

$$9\overline{)\$4.59}\quad \$.51$$

Change 4 DOLLARS to 40 DIMES. Add 5 DIMES.
Divide 45 by 9. Write 5 in DIMES place.
Divide 9 by 9. Write 1 in CENTS place.
Put in the dollar sign and decimal point.
The teachers spent $.51 each.

E

$$5\overline{)255}$$

$$\begin{aligned} 255 \div 5 &= (250 + 5) \div 5 \\ &= (250 \div 5) + (5 \div 5) \\ &= 50 + 1 \\ &= 51 \end{aligned}$$

F

$$3\overline{)156}$$

$$\begin{aligned} 156 \div 3 &= (150 + 6) \div 3 \\ &= (150 \div 3) + (6 \div 3) \\ &= 50 + 2 \\ &= 52 \end{aligned}$$

THE TWOS AND THREES
RELATED MULTIPLICATION AND DIVISION WITH FRACTIONAL FORM

This page is for study only. Study the panels below as you look at the examples on page 69.

A

You know that when a number is divided into 2 equal parts, each part is called one half (1/2).

1/2 of 6 = 6 ÷ 2 = 3

When we divide a number into 3 equal parts, each part is called one third (1/3).

1/3 of 9 = 9 ÷ 3 = 3

1/2 and 1/3 are called **fractions**.

B

1/2 of 12 = 12 ÷ 2 = 6

1/2 of 1200 = 1200 ÷ 2 = 600

C

1/3 of 30 = 30 ÷ 3 = 10

1/3 of 3000 = 3000 ÷ 3 = 1000

D

Multiplying TENS, HUNDREDS, and THOUSANDS is like multiplying ONES:

2 × 6 = 12 **2 × 60 = 120**
2 × 600 = 1200 **2 × 6000 = 12000**

E

Dividing TENS, HUNDREDS, and THOUSANDS is like dividing ONES:

1/2 of 12 = 6 **1/2 of 120 = 60**
1/2 of 1200 = 600 **1/2 of 12000 = 6000**

F

Stacey and Johnny each found 200 eggs.
How many eggs did both children find?
2 × 200 eggs = 400 eggs

They sold half of the eggs.
How many eggs did they sell?
1/2 of 400 eggs = 200 eggs

The **product** in multiplication becomes the **dividend** in division.
Multiplication and division are related.

G

Study these related multiplication and division examples:

(a)	(b)	(c)	(d)
3 × 5 = 15	3 × 50 = 150	3 × 500 = 1500	3 × 5000 = 15000
1/3 of 15 = 5	1/3 of 150 = 50	1/3 of 1500 = 500	1/3 of 15000 = 5000

DIRECTIONS: 1 — Study the examples on this page. The red numerals in the windows are the right answers.

2 — Put a piece of paper or a Magic Slate under this page. Write your answers through the windows where the arrows point.

(Both examples in each pair have the same answer, so you need only write it once.)

3 — To check your work, put your paper or Magic Slate under page 71. See if your answers are the same as the red numerals in the windows.

2×3 1/2 of 6	2×□=60 1/2 of 60=□	2×□=600 1/2 of 600=□	2×□=6000 1/2 of 6000=□
3×3 1/3 of 9	3×30=□ 1/3 of □=30	3×300=□ 1/3 of □=300	3×3000=□ 1/3 of □=3000
3×6 1/3 of 18	3×□=180 1/3 of 180=□	3×□=1800 1/3 of 1800=□	3×□=18000 1/3 of 18000=□
2×4 1/2 of 8	2×40=□ 1/2 of □=40	2×400=□ 1/2 of □=400	2×4000=□ 1/2 of □=4000
3×9 1/3 of 27	3×□=270 1/3 of 270=□	3×□=2700 1/3 of 2700=□	3×□=27000 1/3 of 27000=□
2×7 1/2 of 14	2×□=140 1/2 of 140=□	2×700=□ 1/2 of □=700	2×□=14000 1/2 of 14000=□
2×5 1/2 of 10	2×□=100 1/2 of 100=□	2×500=□ 1/2 of □=500	2×□=10000 1/2 of 10000=□
3×7 1/3 of 21	3×70=□ 1/3 of □=70	3×□=2100 1/3 of 2100=□	3×□=21000 1/3 of 21000=□
2×9 1/2 of 18	2×□=180 1/2 of 180=□	2×900=□ 1/2 of □=900	2×□=18000 1/2 of 18000=□
3×8 1/3 of 24	3×80=□ 1/3 of □=80	3×800=□ 1/3 of □=800	3×8000=□ 1/3 of □=8000

SHORT CUTS IN MULTIPLICATION AND DIVISION

This page is for study only.

A

Multiplication

Work this example the usual way.

```
   (c) (b) (a)
    3   9   4
        ×   5
   ---------
    7   0
```

(a) ONES: $5 \times 4 = 20$ Write 0 in ONES place and carry 2 TENS.
(b) TENS: $5 \times 9 = 45$ Add the 2 TENS you are carrying: $45 + 2 = 47$
Write 7 in TENS place. Carry 4 HUNDREDS.

20
350

800
3500

2000
7000

B

```
   (c) (b) (a)
    3   9   4
        ×   5
   -------------
1   9   7   0
```

(c) HUNDREDS: $5 \times 3 = 15$
Add the 4 HUNDREDS you are carrying: $15 + 4 = 19$
19 HUNDREDS = 1 THOUSAND + 9 HUNDREDS.
Write 9 in HUNDREDS place and 1 in THOUSANDS place.
The product: One thousand, nine hundred seventy.

50
90

500
3600

5000
9000

C

Short cut

```
   (c) (b) (a)
    6   3   8
        ×   4
   -------------
2   5   5   2
```

We know which digits mean ONES, TENS, HUNDREDS, and THOUSANDS, so let's multiply by saying:
(a) $4 \times 8 = 32$ Write 2 and carry 3. (b) $4 \times 3 = 12$; $12 + 3 = 15$
Write 5 and carry 1. (c) $4 \times 6 = 24$; $24 + 1 = 25$ Write 25.
The product: Two thousand, five hundred fifty-two.

320
80

800
4000

8000
8000

D

Division

Work this example the usual way.

```
   (a) (b) (c)
        7   0
   ------------
5 ) 3   5   0
```

(a) Change 3 HUNDREDS to 30 TENS. Add 5 TENS.
(b) TENS: $35 \div 5 = 7$ Write 7 in TENS place.
(c) ONES: $0 \div 5 = 0$ Write 0 in ONES place.
The quotient is seventy.

90
280

4500
700

9000
28000

E

Short cut

```
   (a) (b) (c)
        4   2
   ------------
4 ) 1   6   8
```

We know which digits mean ONES, TENS, and HUNDREDS, so let's divide by saying:
(a) Change 1 to 10. Add 6. (b) $16 \div 4 = 4$ Write 4.
(c) $8 \div 4 = 2$ Write 2.
The quotient is forty-two.

240
300

600
600

24000
30000

CHECKING UP

This page is for study only.

A

Renaming the Dividend

There are many ways to rename the dividend:

$369 = 3$ HUNDREDS $+ 6$ TENS $+ 9$ ONES
$369 =$ 36 TENS $+ 9$ ONES
$369 = 3$ HUNDREDS $+ 69$ ONES

$624 = 6$ HUNDREDS $+ 2$ TENS $+ 4$ ONES
$624 =$ 62 TENS $+ 4$ ONES
$624 = 6$ HUNDREDS $+ 24$ ONES

30 90 | 300 900 | 3000 9000

B

When you rename the dividend, always use the way that lets you divide evenly:

$369 \div 9 = (36 \text{ TENS} + 9 \text{ ONES}) \div 9$
$= (360 + 9) \div 9$
$= (360 \div 9) + (9 \div 9)$
$= 40 + 1 = 41$

$624 \div 6 = (6 \text{ HUNDREDS} + 24 \text{ ONES}) \div 6$
$= (600 + 24) \div 6$
$= (600 \div 6) + (24 \div 6)$
$= 100 + 4 = 104$

60 80 | 600 800 | 6000 8000

C

Checking Multiplication Examples

You may check all multiplication examples by dividing the product by the multiplier. The quotient will equal the multiplicand if the product is correct.

$$\begin{array}{r} 264 \\ \times\ 3 \\ \hline 792 \end{array} \qquad 3\overline{)792}\,264$$

If these two numerals are the same, you can be sure you have the correct product.

90 70 | 900 1400 | 9000 7000

D

The order in which two factors are used in multiplying does not make any difference in the product.

$4 \times 560 = 2240$ $560 \times 4 = 2240$

The product is the same both times.

E

Checking Division Examples

You may check all division examples by multiplying the quotient by the divisor. The product will equal the dividend if the quotient is correct.

50 210 | 1000 700 | 5000 7000

F

Check this example: $328 \div 4 = 72$

$$4\overline{)328}\,72 \qquad \begin{array}{r} 72 \\ \times\ 4 \\ \hline 288 \end{array}$$

The product is not the same as the dividend, so the quotient must be wrong.

Check this example: $328 \div 4 = 82$

$$4\overline{)328}\,82 \qquad \begin{array}{r} 82 \\ \times\ 4 \\ \hline 328 \end{array}$$

The product is the same as the dividend, so the quotient must be correct.

90 240 | 1800 2400 | 9000 24000

DIRECTIONS: 1 — Study the examples on this page. The red numerals in the windows are the right answers.

2 — Put a piece of paper or a Magic Slate under this page. Write your answers through the windows where the arrows point.

(Both examples in each pair have the same answer, so you need only write it once.)

3 — To check your work, put your paper or Magic Slate under page 70. See if your answers are the same as the red numerals in the windows.

4 × 2 1/4 of 8	4 × ▦ = 80 1/4 of 80 = ▦	4 × 200 = ▦ 1/4 of ▦ = 200	4 × ▦ = 8000 1/4 of 8000 = ▦
5 × 7 1/5 of 35	5 × 70 = ▦ 1/5 of ▦ = 70	5 × 700 = ▦ 1/5 of ▦ = 700	5 × ▦ = 35000 1/5 of 35000 = ▦
5 × 5 1/5 of 25	5 × ▦ = 250 1/5 of 250 = ▦	5 × ▦ = 2500 1/5 of 2500 = ▦	5 × ▦ = 25000 1/5 of 25000 = ▦
4 × 9 1/4 of 36	4 × ▦ = 360 1/4 of 360 = ▦	4 × 900 = ▦ 1/4 of ▦ = 900	4 × ▦ = 36000 1/4 of 36000 = ▦
4 × 8 1/4 of 32	4 × 80 = ▦ 1/4 of ▦ = 80	4 × ▦ = 3200 1/4 of 3200 = ▦	4 × ▦ = 32000 1/4 of 32000 = ▦
5 × 8 1/5 of 40	5 × ▦ = 400 1/5 of 400 = ▦	5 × 800 = ▦ 1/5 of ▦ = 800	5 × ▦ = 40000 1/5 of 40000 = ▦
5 × 9 1/5 of 45	5 × ▦ = 450 1/5 of 450 = ▦	5 × 900 = ▦ 1/5 of ▦ = 900	5 × ▦ = 45000 1/5 of 45000 = ▦
4 × 7 1/4 of 28	4 × 70 = ▦ 1/4 of ▦ = 70	4 × ▦ = 2800 1/4 of 2800 = ▦	4 × 7000 = ▦ 1/4 of ▦ = 7000
4 × 6 1/4 of 24	4 × 60 = ▦ 1/4 of ▦ = 60	4 × ▦ = 2400 1/4 of 2400 = ▦	4 × 6000 = ▦ 1/4 of ▦ = 6000
5 × 6 1/5 of 30	5 × 60 = ▦ 1/5 of ▦ = 60	5 × ▦ = 3000 1/5 of 3000 = ▦	5 × 6000 = ▦ 1/5 of ▦ = 6000

THE FOURS AND FIVES
RELATED MULTIPLICATION AND DIVISION WITH FRACTIONAL FORM

This page is for study only. Study the panels below as you look at the examples on page 72.

A

When a number is divided into 4 equal parts, each part is called one quarter (1/4).

1/4 of 12 = 12 ÷ 4 = 3

When a number is divided into 5 equal parts, each part is called one fifth (1/5).

1/5 of 15 = 15 ÷ 5 = 3

1/4 and 1/5 are fractions.

B

1/4 of 8 = 8 ÷ 4 = 2

1/4 of 8000 = 8000 ÷ 4 = 2000

C

1/5 of 50 = 50 ÷ 5 = 10

1/5 of 500 = 500 ÷ 5 = 100

D

Multiplying and dividing TENS, HUNDREDS, and THOUSANDS is like multiplying and dividing ONES:

4 × 4 = 16	4 × 40 = 160	4 × 400 = 1600	4 × 4000 = 16000
1/4 of 16 = 4	1/4 of 160 = 40	1/4 of 1600 = 400	1/4 of 16000 = 4000

E

The product in multiplication becomes the dividend in division. Multiplication and division are related.

5 × 600 = 3000 (3000: product)

1/5 of 3000 = 600 (3000: dividend)

F

Study these related examples:

(a)	(b)	(c)	(d)
4 × 5 = 20	5 × 30 = 150	4 × 900 = 3600	5 × 2000 = 10000
1/4 of 20 = 5	1/5 of 150 = 30	1/4 of 3600 = 900	1/5 of 10000 = 2000

REVIEW: STUDY OF EQUATIONS – MISSING NUMERALS (1)

This page is for study only. Study the panels below as you look at the examples on page 75.

A

$$\begin{array}{r} 237 \\ \times \square \\ \hline 948 \end{array}$$

How many children must jump rope 237 times each to make a total of 948 jumps?
Look at the ONES. Think: By what number is 7 multiplied to equal a product ending in 8?
$4 \times 7 = 28$ Check: Does $4 \times 237 = 948$?
Yes. The missing multiplier is 4.

$$\begin{array}{r} 237 \\ \times 4 \\ \hline 948 \end{array}$$

B

$$9\overline{)3\square\square}\quad \text{quotient: } 4\ 0$$

TENS: $3\square \div 9 = 4$? Answer: $36 \div 9 = 4$
Then 6 is the missing numeral in TENS place.
ONES: $\square \div 9 = 0$? Answer: $0 \div 9 = 0$
The missing numeral in ONES place is 0.

$$9\overline{)360}\quad \text{quotient: } 40$$

C

James found some shells he wanted to keep. He placed them in 6 groups, or sets, with 4 shells in each set. How many shells were there in all? You probably know the answer. One way to find it is shown at the right.

$6 \times 4 = 24$

$$\begin{aligned} 6 \times 4 &= (5+1) \times 4 \\ &= (5 \times 4) + (1 \times 4) \\ &= 20 + 4 \\ &= 24 \end{aligned}$$

Notice that the 6 was renamed $(5 + 1)$. In Panels D and E, below, note how you may rename numerals if you wish to do so.

D

$$\begin{aligned} 6 \times 4 &= (1 \times 4) + (5 \times 4) \\ &= 4 + 20 = 24 \\ &= (2 \times 4) + (4 \times 4) \\ &= 8 + 16 = 24 \\ &= (3 \times 4) + (3 \times 4) \\ &= 12 + 12 = 24 \end{aligned}$$

E

$$\begin{aligned} 6 \times 4 &= (6 \times 3) + (6 \times 1) \\ &= 18 + 6 = 24 \\ &= (6 \times 2) + (6 \times 2) \\ &= 12 + 12 = 24 \\ &= (6 \times 1) + (6 \times 3) \\ &= 6 + 18 = 24 \end{aligned}$$

4×8=32

a $(4\times6)+(4\times\square)=32$
b $(4\times\square)+(4\times3)=32$
c $(4\times4)+(\square\times4)=32$

a▶ b▶ c▶ d▶

d
$$5\overline{)5\square5}\quad 101$$

6×10=60

a $(5\times10)+\square=60$
b $(4\times10)+\square=60$
c $(\square\times10)-10=60$

a▶ b▶ c▶ d▶

d
$$\begin{array}{r} 3\square \\ \times\ 7 \\ \hline 238 \end{array}$$

9×5=45

a $(6\times5)+(\square\times5)=45$
b $(\square\times5)+(2\times5)=45$
c $(5\times5)+(\square\times5)=45$

a▶ b▶ c▶ d▶

d
$$3\overline{)\square06}\quad 302$$

DIRECTIONS: 1 — Study the examples on this page. The examples are named **a**, **b**, **c**, and **d**. The red numerals in the windows are the right answers.

7×5=35

a $(\square\times5)+(3\times5)=35$
b $(7\times\square)+(7\times3)=35$
c $(7\times4)+(7\times\square)=35$

a▶ b▶ c▶ d▶

d
$$\begin{array}{r} \square4 \\ \times\ 3 \\ \hline 192 \end{array}$$

6×5=30

a $(3\times5)+(\square\times5)=30$
b $(\square\times5)+(2\times5)=30$
c $(5\times5)+(1\times5)=\square$

a▶ b▶ c▶ d▶

d
$$8\overline{)32\square}\quad 41$$

3×20=60

a $(3\times20)-\square=50$
b $(2\times\square)+20=60$
c $(4\times20)-20=\square$

a▶ b▶ c▶ d▶

d
$$\begin{array}{r} 9\square \\ \times\ 4 \\ \hline 380 \end{array}$$

2 — Put a piece of paper or a Magic Slate under this page. Write your answers through the windows where the arrows point. Write your answer for **a** where the a▶ points; for **b** where the b▶ points, etc.

3×12=36

a $(3\times10)+(\square\times2)=36$
b $(3\times\square)+(3\times1)+(3\times2)=36$
c $(3\times7)+(\square\times5)=36$

a▶ b▶ c▶ d▶

d
$$2\overline{)6\square4}\quad 342$$

30×40=1200

a $(3\times400)-200=\square$
b $(1\times400)+\square=1000$
c $3\times\square=1200$

a▶ b▶ c▶ d▶

d
$$\begin{array}{r} \square5 \\ \times\ 6 \\ \hline 270 \end{array}$$

3 — To check your work, put your paper or Magic Slate under page 77. See if your answers are the same as the red numerals in the windows.

REVIEW: STUDY OF EQUATIONS – MISSING NUMERALS (2)

This page is for study only. Study the panels below as you look at the examples on page 77.
DO NOT write through the windows on this page.

700
8
3500
246

300
25
60
6

6
1000
12
4

A

Sally picked 180 poppies.
She tied them in bunches of 20.
How many bunches were there?

$$\square)\overline{180}\quad 20$$

TENS: $18 \div \square = 2$? $18 \div 9 = 2$
ONES: Does $0 \div 9 = 0$? Yes.
The missing divisor is 9.

$$9)\overline{180}\quad 20$$

B

Now think this one out!

$$\begin{array}{r} \square 42 \\ \times\ 5 \\ \hline 1710 \end{array}$$

ONES: $5 \times 2 = 10$ Write 0 in ONES place. Carry 1 TEN.
TENS: $5 \times 4 = 20$ $20 + 1 = 21$ Write 1 TEN. Carry 2 HUNDREDS.

HUNDREDS: $(5 \times \square) + 2 = 17$?
Try 2. $5 \times 2 = 10$
Does $10 + 2 = 17$? No.
Try 3. $5 \times 3 = 15$
Does $15 + 2 = 17$? Yes.
The missing numeral is 3.

$$\begin{array}{r} 342 \\ \times 5 \\ \hline 1710 \end{array}$$

400
8
50
728

30
400
240
7

32
800
4
452

C

$9 \times 14 = 126$ Here are three ways to find the product:

(a) $9 \times 14 = 9 \times (10 + 4)$
$= (9 \times 10) + (9 \times 4)$
$= 90 + 36$
$= 90 + (30 + 6)$
$= (90 + 30) + 6$
$= 120 + 6$
$= 126$

(b) $10 + 4$
$\times\ 9$
$= (9 \times 10) + (9 \times 4)$
$= 90 + 36$
$= 90 + (30 + 6)$
$= (90 + 30) + 6$
$= 120 + 6$
$= 126$

(c) $\overset{3}{14}$
$\times\ 9$
126

In (a) and (b), we renamed 14 and 36 because it is *easier* to put all the TENS together and all the ONES together.

Do you see how much *quicker* it is to work example (c), where all you have to do is remember to carry 3 TENS?

50
400
350
423

600
90
200
360

D

$35 \div 7 = 5$ ..... $7)\overline{35}\quad 5$

$350 \div 7 = 50$ ..... $7)\overline{350}\quad 50$

$3500 \div 7 = 500$ ..... $7)\overline{3500}\quad 500$

E

$28 \div 4 = (20 \div 4) + (8 \div 4)$
$= 5 + 2 = 7$
$= (16 \div 4) + (4 \div 4) + (8 \div 4)$
$= 4 + 1 + 2 = 7$
$= (12 \div 4) + (4 \div 4) + (4 \div 4) + (8 \div 4)$
$= 3 + 1 + 1 + 2 = 7$

30 ÷ 5 = 6

a 30 ÷ 6 = ▦
b 5 × ▦ = 300
c (▦ × 6) + 30 = 330

a ▶ 2
b ▶ 5
c ▶ 4
d ▶ 505

d
$$\begin{array}{r} 70 \\ \square\overline{)210} \end{array}$$

8 ÷ 4 = 2

a 80 ÷ 4 = ▦
b 4 × 200 = ▦
c 800 ÷ ▦ = 200

a ▶ 10
b ▶ 20
c ▶ 7
d ▶ 34

d
$$\begin{array}{r} 8\square5 \\ \times\ 5 \\ \hline 4125 \end{array}$$

36 ÷ 9 = 4

a 360 ÷ 4 = ▦
b 4 × 90 = ▦
c 3600 ÷ 4 = ▦

a ▶ 3
b ▶ 7
c ▶ 4
d ▶ 906

d
$$\begin{array}{r} 41 \\ 7\overline{)\square\square7} \end{array}$$

DIRECTIONS: 1 — Study the examples on this page. The examples are named **a**, **b**, **c**, and **d**. The blue numerals in the windows are the right answers.

40 ÷ 8 = 5

a 80 × 5 = ▦
b 400 ÷ 5 = ▦
c ▦ × 8 = 400

a ▶ 4
b ▶ 2
c ▶ 1
d ▶ 64

d
$$\begin{array}{r} \square\square5 \\ \times\ 8 \\ \hline 3480 \end{array}$$

24 ÷ 4 = 6

a ▦ ÷ 4 = 60
b 2400 ÷ 6 = ▦
c 4 × ▦ = 240

a ▶ 3
b ▶ 4
c ▶ 30
d ▶ 328

d
$$\begin{array}{r} 30 \\ 8\overline{)\square\square0} \end{array}$$

45 ÷ 9 = 5

a 450 ÷ ▦ = 50
b ▦ ÷ 9 = 500
c 45000 ÷ 9 = ▦

a ▶ 10
b ▶ 20
c ▶ 60
d ▶ 95

d
$$\begin{array}{r} \square64 \\ \times\ 4 \\ \hline 3056 \end{array}$$

2 — Put a piece of paper or a Magic Slate under this page. Write your answers through the windows where the arrows point. Write your answer for **a** where the ▶ points; for **b** where the ▶ points, etc.

28 ÷ 2 = 14

a (▦ ÷ 2) + (8 ÷ 2) = 14
b (10 ÷ 2) + (▦ ÷ 2) + (8 ÷ 2) = 14
c 280 ÷ 2 = ▦

a ▶ 3
b ▶ 9
c ▶ 3
d ▶ 684

d
$$\begin{array}{r} 100 \\ 9\overline{)9\square0} \end{array}$$

32 ÷ 4 = 8

a (20 ÷ ▦) + (12 ÷ 4) = 8
b (▦ ÷ 4) + (4 ÷ 4) + (4 ÷ 4) = 8
c 320 ÷ 8 = ▦

a ▶ 1000
b ▶ 600
c ▶ 400
d ▶ 45

d
$$\begin{array}{r} \square\square6 \\ \times\ 3 \\ \hline 2358 \end{array}$$

3 — To check your work, put your paper or Magic Slate under page 79. See if your answers are the same as the blue numerals in the windows.

NOTE: Pay no attention to the red and black numerals outside the boxes.

5 × 708 = 3540

a 5×(▦+8)=3540
b (5×700)+(5×▦)=3540
c ▦ + 40 =3540

400 5 2400 684 ◀a ◀b ◀c ◀d

d
$$\begin{array}{r} 41 \\ 6\overline{)\square\square 6} \end{array}$$

325 ÷ 5 = 65

a (▦+25)÷5=65
b (300÷5)+(▦÷5)=65
c ▦ + 5 =65

700 70 10 276 ◀a ◀b ◀c ◀d

d
$$\begin{array}{r} 143 \\ \times\square \\ \hline 858 \end{array}$$

2 × 1006 = 2012

a 2×(1000+▦)=2012
b (2×▦)+(2×6)=2012
c 2000 + ▦ =2012

500 8 4000 145 ◀a ◀b ◀c ◀d

d
$$\square\overline{)448}\quad 112$$

DIRECTIONS: 1 — Study the examples on this page. The examples are named **a**, **b**, **c**, and **d**. The red numerals in the windows are the right answers.

408 ÷ 8 = 51

a (▦+8)÷8=51
b (400÷8)+(8÷▦)=51
c ▦ + 1 =51

50 400 10 160 ◀a ◀b ◀c ◀d

d
$$\begin{array}{r} \square 2\square \\ \times 3 \\ \hline 2184 \end{array}$$

8 × 430 = 3440

a 8×(400+▦)=3440
b (8×▦)+(8×30)=3440
c 3200 + ▦ =3440

30 400 3600 321 ◀a ◀b ◀c ◀d

d
$$\square\overline{)357}\quad 51$$

832 ÷ 8 = 104

a (800+▦)÷8=104
b (▦÷8)+(32÷8)=104
c 100 + ▦ =104

6 800 403 459 ◀a ◀b ◀c ◀d

d
$$\begin{array}{r} \square\square 2 \\ \times 7 \\ \hline 3164 \end{array}$$

2 — Put a piece of paper or a Magic Slate under this page. Write your answers through the windows where the arrows point. Write your answer for **a** where the ◀a points; for **b** where the ◀b points, etc.

7 × 453 = 3171

a 7×(400+▦+3)=3171
b (7×▦)+(7×50)+(7×3)=3171
c 2800 + ▦ + 21 =3171

600 4000 300 3 ◀a ◀b ◀c ◀d

d
$$\begin{array}{r} \square 2\square \\ \times 4 \\ \hline 1692 \end{array}$$

693 ÷ 3 = 231

a (▦+90+3)÷3=231
b (600÷3)+(▦÷3)+(3÷3)=231
c ▦ + 30 + 1 =231

400 50 2400 248 ◀a ◀b ◀c ◀d

d
$$\square\overline{)3\square\square}\quad 40$$

3 — To check your work, put your paper or Magic Slate under page 76. See if your answers are the same as the red numerals in the windows.

NOTE: Pay no attention to the blue and black numerals outside the boxes.

REVIEW: RENAMING AND REGROUPING MULTIPLICATION AND DIVISION TABLES

This page is for study only. Study the panels below as you look at the examples on page 78.
DO NOT write through the windows on this page.

5
60
50
3

20
800
4
825

90
360
900
287

A

$7 \times 643 = 4501$

$= 7 \times (600 + 40 + 3)$ ← Here the factor 643 has been renamed $(600 + 40 + 3)$.
$= (7 \times 600) + (7 \times 40) + (7 \times 3)$ ← Here the renamed numeral has been regrouped.
$= 4200 + 280 + 21 = 4501$

Remember: When you rename a numeral by breaking it down into two or more addends, the sum of the addends must equal the numeral.

B

$8 \times 555 = 4440$

$(8 \times 500) + (8 \times \square) + (8 \times 5) = 4440$
$(8 \times 400) + (8 \times 100) + (8 \times \square) + (8 \times 5) = 4440$
$3200 + 800 + 400 + 40 = 4440$

When you have decided what numeral belongs where the screen is, check it by looking at the red numeral in the lower right corner of page 80.

400
80
50
435

240
400
60
240

9
4500
5000
764

C

MULTIPLICATION AND DIVISION TABLE

(through 5×9, 9×5, $45 \div 5$ and $45 \div 9$)

ROWS \ COLUMNS	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9
2	0	2	4	6	8	10	12	14	16	18
3	0	3	6	9	12	15	18	21	24	27
4	0	4	8	12	16	20	24	28	32	36
5	0	5	10	15	20	25	30	35	40	45
6	0	6	12	18	24	30				
7	0	7	14	21	28	35				
8	0	8	16	24	32	40				
9	0	9	18	27	36	45				

This table shows all of the basic multiplication and division facts (combinations) you have studied and practiced in this book. You may wish to make a larger table like it. Panels D and E will tell you how the table works. Study them; then work out other combinations for yourself.

20
10
140
900

4
24
40
786

D

MULTIPLICATION

Suppose you want to find the product of 3×4. Look at the table. Find Row 3. Look across the row. Now find Column 4 and look down the column. Where Row 3 and Column 4 meet is the numeral 12. It is the product you are looking for.

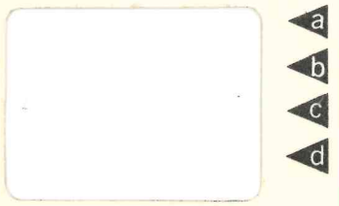
E

DIVISION

Suppose you want to find the quotient of $10 \div 5$. Look at the table. Find Row 5. Look across the row until you find the numeral 10. Now look up the column above 10. You find the numeral 2 at the top. It is the quotient you are looking for.

6 × 405 = 2430

a 6×(▦+5)=2430
b (6×400)+(6×▦)=2430
c ▦ + 30 =2430



d
$$\begin{array}{r} 68▦ \\ \times\ 5 \\ \hline 3420 \end{array}$$

770 ÷ 7 = 110

a (▦+70)÷7=110
b (700÷7)+(▦÷7)=110
c 100 + ▦ =110

d
$$7\overline{)▦7▦}\quad 92$$

8 × 540 = 4320

a 8×(▦+40)=4320
b (8×500)+(▦×40)=4320
c ▦ + 320 =4320

d
$$\begin{array}{r} ▦▦5 \\ \times\ 9 \\ \hline 1305 \end{array}$$

DIRECTIONS: 1 — Study the examples on this page. The examples are named **a**, **b**, **c**, and **d**. The blue numerals in the windows are the right answers.

450 ÷ 5 = 90

a (400 + ▦) ÷ 5 = 90
b (▦ ÷ 5) + (50 ÷ 5) = 90
c 80 + ▦ =90

d
$$4\overline{)1▦▦}\quad 40$$

9 × 430 = 3870

a 9×(400+▦)=3870
b (9×▦)+(9×30)=3870
c ▦ + 270 =3870

d
$$\begin{array}{r} ▦▦▦ \\ \times\ 4 \\ \hline 1284 \end{array}$$

806 ÷ 2 = 403

a (800 + ▦) ÷ 2 = 403
b (▦ ÷ 2) + (6 ÷ 2) = 403
c 400 + 3 =▦

d
$$2\overline{)▦5▦}\quad 51$$

2 — Put a piece of paper or a Magic Slate under this page. Write your answers through the windows where the arrows point. Write your answer for **a** where the ◀a points; for **b** where the ◀b points, etc.

4608 ÷ 2 = 2304

a (4000+▦+8)÷2=2304
b (▦÷2)+(600÷2)+(8÷2)=2304
c 2000 + ▦ + 4 =2304

d
$$\begin{array}{r} 659 \\ \times\ ▦ \\ \hline 1977 \end{array}$$

6 × 452 = 2712

a 6×(▦+50+2)=2712
b (6×400)+(6×▦)+(6×2)=2712
c ▦ + 300 + 12 =2712

d
$$8\overline{)▦▦▦}\quad 31$$

3 — To check your work, put your paper or Magic Slate under page 78. See if your answers are the same as the blue numerals in the windows.

Answer to Panel B, page 79: **50**

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